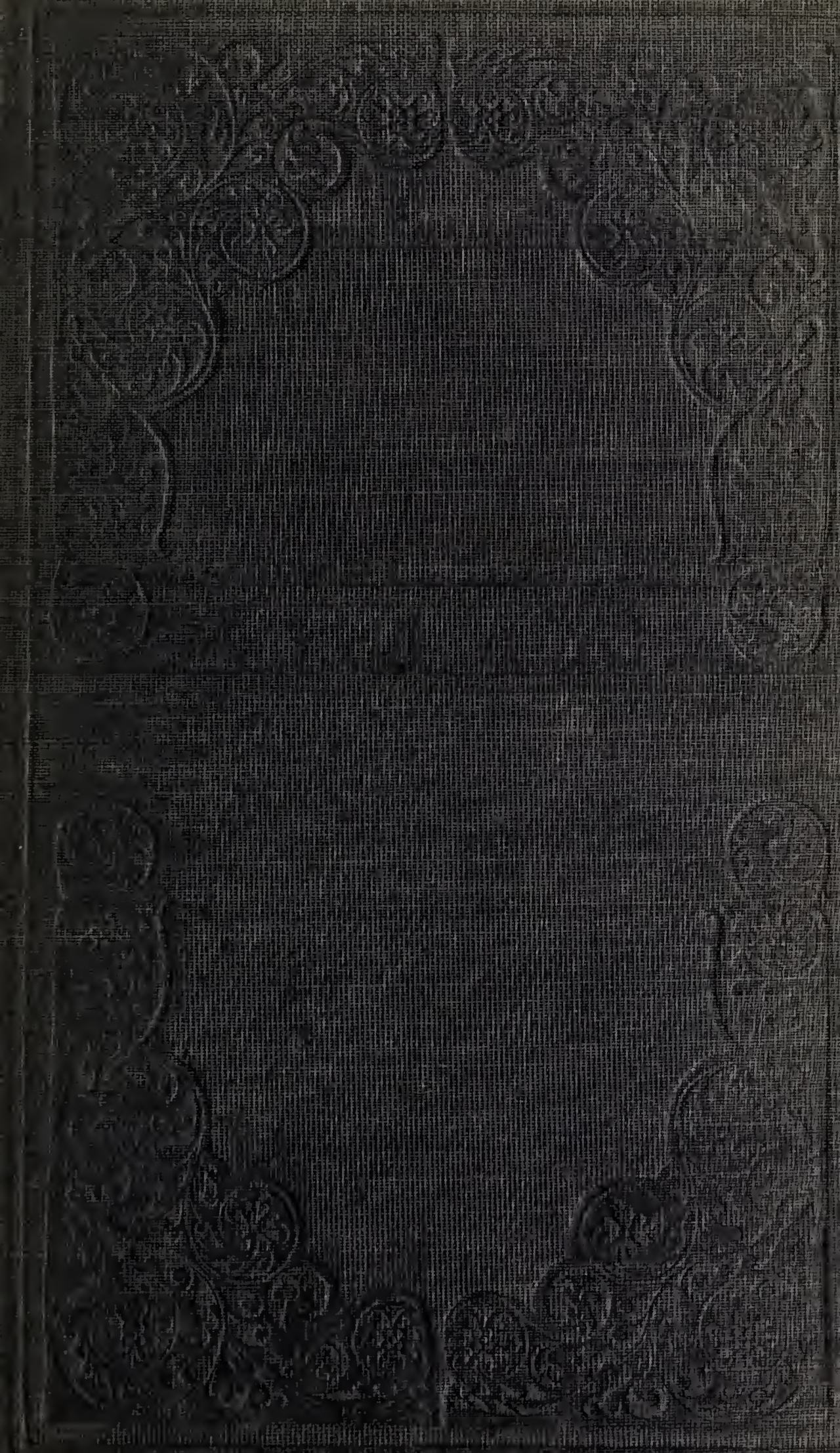

BRAITHWAITE'S RETROSPECT.

VOL. XXVII. JANUARY—JUNE, 1853.

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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

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LECTURER ON OBSTETRIC MEDICINE AT THE LEEDS SCHOOL OF MEDICINE, ETC.

VOL. XXVII. JANUARY—JUNE.

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A SYNOPSIS

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

ASCITES.—Whenever ascites is complicated with gastro-intestinal irritation, and where digitalis cannot be administered internally, the decoction applied as a fomentation acts as a most powerful diuretic, and may be used with great success. (M. Andral, p. 44).

FEVER.—As a tonic, guaco (Mikania guaco) is a most valuable drug after the fever has passed off: its effects were magical, where quinine produced restlessness, thirst, and headache. (Dr. E. W. Pritchard, p. 322).

GOUT, *Acute.*—Infuse 32 grammes of ash-leaves in a sufficient quantity of water. Let the dose be taken at bed-time, early in the morning, and between breakfast and dinner. Continue it also for eight days after the symptoms have disappeared.

Chronic.—Take the same doses as above, night and morning, for a long period. Fits of gout may be indefinitely postponed by having recourse to this treatment—say for eight or ten days in every month.

RHEUMATISM.—Give an infusion of ash-leaves (Fraxinus excelsior). It possesses the advantages without the inconveniences of colchicum. Generally under its use, at the end of four or five days, or sometimes sooner, the pain, redness, and swelling visibly diminish in intensity, or even disappear. Each dose of the powdered leaves ought to be infused for three hours in boiling water, and before taken should be strained through a linen cloth, and sweetened to taste. Dr. Otterbourg says that 32 grammes infused in a sufficient quantity of water may be taken several times during the day. There is no need to change the mode of living. (Drs. Pouget and Peyraud, p. 320).

Rheumatic Fever.—Colchicum, calomel, and opium, along with the free use of alkalies, are the main remedies; the latter especially, because probably there is an acidulous state of the blood. To alleviate the pain of articular inflammation, warm alkaline and opiate fomentations are valuable. The best form for the latter is ʒ j. of carbonate of potash, dissolved either in a pint of decoction of poppies, or of rose water, to which 6 drachms of Battley's solution is added. The relief from this is said to be almost immediate. (Dr. Fuller, p. 37).

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—In children under fourteen years of age, give from half a grain to a grain, three times a day, of the ammonio-sulphate of copper. It succeeded where the sulphate of zinc and the sesquichloride of iron had completely failed. It is not a novel remedy, but it is much neglected. (Dr. Hamilton Roe, p. 319).

Neuralgia.—In a severe case of this painful disease, a solution of 15 grains of acetate of morphia in ʒ j. of creosote was introduced to the supra-orbital nerve, and along the course of the temporal, malar, and buccal nerves, by four punctures of an instrument made for that purpose. In a minute all pain from the disease ceased. In another case of *neuralgic sciatica,* the same plan of narcotic inoculation was followed by making one puncture behind the trochanter, and one half way down the thigh. Blisters are very valuable, but more so when the raw surface is sprinkled over with one of the following powders every six hours:—Morphia hydrochl., gr. j.; pulv. acaciæ, gr. xij. In pulv. iv., dividendus. This plan is very valuable in acute sciatica. Acetic æther may be also painted over the painful nerve. Chloroform may be applied, by soaking lint with it, and placing it upon the painful part, and covering it with oiled silk so as to prevent evaporation; or an ointment made with ʒ j. of chloroform and ℥ j. of lard may be smeared over the painful nerve. (Dr. E. Morris, p. 293).

Facial.—Rub a piece of the following ointment, of the size of a walnut, over the affected part. Chloroform, 20 parts; prussiate of potash, 10 parts; and lard 60 parts; an oiled-silk cap is then to be worn for some hours. (M. Cazenave, p. 60).

Spinal Exhaustion.—For this condition, strychnia is one of our best tonics, improving the general health, and conducing to the recovery of strength and flesh. It may be given in minute doses three times a day, in the midst of meals, for many months, in the following formula:—Strychniæ acetatis, gr. j.; acidi acetosi, ♏xx.; alcoholis, ʒ ij.; aquæ destillatæ, ʒ vi. M. Of this ten drops, containing 1-50th of a grain, may be given three times a day. The best plan is to begin with five, and go on to fifteen. (Dr. Marshall Hall, p. 58).

Tetanus and Hydrophobia.—From the experiments of Dr. Marshall Hall, he arrives at the two following practical conclusions:—1st. That the tetanic patient be preserved from all external excitement absolutely. 2nd. The hydrophobic patient, whilst equally preserved from excitement, should be submitted to efficient tracheotomy. (Dr. Marshall Hall, p. 59).

Tic Douloureux.—Give the following in doses of two tablespoonfuls three times a day; or three tablespoonfuls at once, if the pain is severe:—℞. Ferri potassio-tartrat. ℈ ij.; vini opii ♏lxxx.; aquæ cinnamomi ʒ viij. M. (Mr. J. W. Beaumont, p. 59).

AFFECTIONS OF THE CIRCULATORY ORGANS.

Aneurism.—Mr. Hodgson, President of the Medical and Chirurgical Society, commenting on a case of popliteal aneurism, read by Dr. Munro, said, that ample experience had now proved that *long-continued moderate* pressure is all that is required to bring about the cure of this disease, and not such a degree of violent pressure as would mechanically prevent the flow of blood through the vessel. (Mr. Hodgson, p. 147).

Varicose Veins.—Mr. Henry Lee operates upon these cases in the following manner:—He first introduces a needle

under the vein to be obliterated, and leaves it there for a few days. 2nd, after that time, when the blood on either side of the needle has become coagulated, the operation is completed by dividing the vein by a subcutaneous incision. The vein must be blocked up before incision is performed, and then we know that no abnormal product, as pus, can pass into the current of the circulation from the division of the coats. Hence the blood must be kept at rest for a certain time in the vein. By this plan we are assured that the coagulum so formed consists of blood alone, and no other vitiated fluid. (Mr. H. Lee, p. 149).

AFFECTIONS OF THE RESPIRATORY ORGANS.

Tracheotomy.—Dr. Henry Thompson has recently invented an instrument (see wood-cut, p. 166) by which tracheotomy is much facilitated. It somewhat resembles a pair of dissecting forceps, having, at one extremity, an angle formed about an inch and a half in length. The points are furnished with a fine cutting edge, and meet so accurately that one blade is formed as it were together. The cricoid cartilage is first felt for, and at a quarter of an inch below its inferior margin, the blade portion is to be introduced *transversely* between the rings of the trachea; then, by means of a screw, the blades are separated, and the wound dilated. A full-sized curved tracheal tube, of moderate length, and having an additional opening in the upper wall, about the centre, is then to be introduced into the wound. (Dr. H. Thompson, p. 165).

AFFECTIONS OF THE DIGESTIVE ORGANS.

Anus, *Fissure of.*—It is now well known that a small incision, slightly exceeding the length and depth of the little ulcerated fissure, is sufficient for its remedy, without any after treatment, or restriction from exercise, beyond a day or two of quiet. (Prof. Syme,—*Monthly Journal, April* 1853, p. 314).

Dyspepsia.—Excess of acidity of the stomach being one of the most common causes of dyspepsia, it should be neutralized. In such cases, alkalies, with bitter tonics, and the direct introduction of animal oils in excess, are indicated. On the other hand, the quantity of gastric juice may be diminished, as from overtasking the powers of digestion at feasts, or in the feeble digestion of old people. In acute cases, a stimulant, as the moderate use of generous wines after dinner, is useful. Old people thus afflicted should give up drinking tea, and should take a little weak brandy and water at bedtime. In chronic cases, acids are indicated, especially muriatic acid. In chlorotic females, the tinct. ferri co. may be given. When fatty matters are difficult to digest, alkalies, especially the liq. potassæ, with vegetable tonics, may be given. When bile is deficient, give gentle mercurial purges, with extract of taraxacum, or the compound rhubarb pill—this last favours the flow of bile into the upper part of the alimentary canal. Dr. Clay, of Manchester, recommends the administration of ox-gall. Excess of bile, on the other hand, is to be treated by drastic purgatives, diuretics, and diaphoretics, to cause excess of excretion. Exercise, by increasing the action of the lungs, and relieving the liver in its office of separating hydrocarbon, is to be insisted upon. (Prof. J. H. Bennett, p. 90).

Fistula-in-ano.—After the incision of fistula, to prevent the edges of the wound from uniting, touch them with the nitrate of silver. By this plan there is no necessity for interposing tents, lint, or other material. The application may be made at first every, and then every other morning. (M. Alquié, p. 175).

Hare-lip.—The ages at which the operation for hare-lip are most successful are—somewhat advanced age; next, infancy; and, lastly, childhood. If the jaw itself projects, a variety of opinions have been offered as to the best means of removing the obstruction, some advocating the removal of the portion, others not. Gensoul has recommended the bending back of the projecting portion,

and Mr. Haynes Walton has put this recommendation into practice with success by partially dividing the projection, and then pressing it backwards. (Mr. Haynes Walton, p. 169).

Hemorrhoids.—Give an opening pill at bed-time, and an aperient draught in the morning, so as to bring the parts into view; then apply nitric acid to each pile freely by means of a mop of lint, having some liq. potassæ in a dossil of lint ready lest the caustic should touch the sound skin. In the course of a week, if the vitality of the part is not completely destroyed, re-apply it. Give an anodyne at night and an aperient after the lapse of two or three days. (Dr. W. Cooke, p. 176).

Internal.—Of all means the ligature, when properly applied, affords the relief desired with most ease to the patient, with the most permanent advantage, and with the greatest security from danger. (Prof. Syme, *Monthly Journal, April,* 1853, p. 313).

Hernia.—The rule of practice should be that in cases of strangled hernia the parts should be freed with the least possible delay. The taxis should not be resorted to where constitutional symptoms have manifested themselves, or in those cases where the local pain or tension show the encroachment of lesions, which, if unchecked, must prove fatal; or, lastly, where strangulation has been protracted beyond a few hours. (Mr. J. Gay, p. 170).

Lead Colic.—Compound extract of colocynth, with calomel and opium, is the best purgative. To prevent the constitutional effects of the calomel, combine these remedies with croton-oil. Acute cases are relieved by a bath containing the sulphide of potassium in the proportion of 4 ounces to 30 gallons. In the *paralysis from lead* the same bath is valuable, along with the galvanic form of electricity. The way in which this is produced is as follows:—The positive metal is to be considered the lead in the nerves, muscles, and tissues, and the negative metal plates of copper attached to the limb itself, a weak solution of acetic acid forming the oxidating link. Acetic

acid is chosen because the acetate of lead is soluble. (Dr. J. Alderson, p. 297).

Sarcina Ventriculi.—One indication necessary to be fulfilled in the treatment of this disease is to destroy the fungus by a regular and systematic exhibition of alkalies, thereby removing the acidity so essential to its formation and development, and then to employ some remedy capable of destroying its growth. This may be done by giving bicarbonate of potash and infusion of quassia, and afterwards the sulphite of soda. The operation of this salt seems to be that the sulphite being decomposed in the stomach by the acids therein generated, sulphurous acid gas is liberated, the destructive effects of which upon parasitic formations like the sarcina is well known. (Dr. Hassall, p. 93).

Stomatitis (*Ulcerated*) *and* Cancrum Oris.—In a severe epidemic of this disease the cases were treated by a mild aperient of magnesia and rhubarb, and by chlorate of potash dissolved in water sweetened with syrup, in doses of 4 grains every fourth hour. The mouth was also washed with a weak solution of chloride of sodium. They all recovered in about six days. (Dr. J. H. Babington, p. 92).

Tonsils, *Enlargement of.*—This condition frequently produces great inconveniences, impeding respiration, especially during sleep, rendering the voice husky, inducing a tendency to sore throat, and occasionally producing deafness. They may be removed with perfect safety by the knife, and such an amount of speedy and permanent relief afforded as justly to merit the title of a substantial improvement in the practice of surgery. (Prof. Syme, *Monthly Journal*, *April*, 1853, p. 310).

Vomiting.—Vomiting, either from sea sickness, from overflow of bile, from disease of the liver, and in some cases obstinate vomiting from other causes, may be relieved by a few doses of chloroform. Three or four drops well shaken up with water may be taken for a dose.

The same dose may be likewise used as a preventive against sea sickness. (Dr. T. Inman, p. 92).

AFFECTIONS OF THE URINARY ORGANS.

Albuminuria.—Albumen is to be detected by nitric acid and heat. Albumen may be present in cholera, puerperal fever, pyelitis, gestation, or inflammation of urinary mucous membranes, but especially in

1st. *Acute Desquamative Nephritis.*—Here is inflammation or congestion characterized by fibrinous casts with blood discs, nuclei, and epithelial cells, united by fibrinous matter.

2nd. *Chronic Desquamative Nephritis.*—A chronic form of last. By long-continued shedding of epithelium with the urine, in a more or less disintegrated state.

3rd. *Waxy Degeneration of Kidney.*—By the discharge of waxy casts in urine, varying in size. All the cases of this kind which Dr. Johnson has seen have recovered.

4th. *Non-desquamative Disease.*—The elimination of some poison, as scarlet fever. There is congestion or inflammation and escape of serum, but no exfoliation of epithelium.

5th. *Fatty Degeneration.*—Large quantities of oil globules, mixed with epithelial cells and tube casts. Oil cells are known by their rounded uniform shape, and by their broad black margins, produced by their strong refractive power. (Dr. G. Johnson, p. 104, 111).

Diabetes.—The diet may consist of every description of meat, with the usual sauces, to the exclusion, however, of all feculent and saccharine substances. Fish of all varieties, and eggs, in the several modes of preparation, are proper. The Bordeaux wines are the best. Beer should not be drunk. Coffee, with a little cream, is a good drink. To relieve thirst, Seltzer, spa, Vichy, or soda water may be taken; but acid drinks are objectionable. The patient should eat slowly, masticating his food well, and taking it in moderate quantities. A flannel bandage round the epigastrium assists in reducing the stomach to its normal dimensions. The patient should be completely clothed in flannel. General frictions are also useful. Exercise should be taken as the strength permits. Along with these means carbonate of

ammonia may be taken, assisted by opiates, in doses of from 77 to 230 grains in the 24 hours. Emetics are often useful at the commencement, and the disturbed functions of the liver may be modified by aperients, of which ox-gall is the best. (M. Bouchardat, p. 117).

Give the permanganate of potash, beginning with 2 or 3 grains three times a day, and add 1 grain to each dose every third day, unless it be found to disagree. (Mr. G. Sampson, p. 120).

Incontinence of Urine.—In a case of this kind, which had lasted for five months, from paralysis of the neck of the bladder, after the internal administration of strychnine had failed, a solution was injected into the bladder (0·50 centig. of strychnine to 500 centig. of water). Complete recovery was the result. (Dr. Panel, p. 121).

Testicle, *Air-Compressor of the.*—[For a detailed description of Mr. Hutchinson's apparatus for this purpose see page 189. It is intended to be used in cases of chronic and subacute inflammation of the gland, varicocele, some peculiar forms of hydrocele after paracentesis, and possibly malignant affections.]

Fungus of.—This was once constantly removed by the knife or caustic. It admits of recovery by inducing absorption of its interstitial effusion. To effect this, an easy method is to detach the scrotal integuments from their subjacent connections sufficiently for allowing them to unite over the tumour, and thus subject it to the influence of pressure. (Prof. Syme, *Monthly Journal, April*, 1853, p. 311).

Urine, *Pus in.*—When the urine contains pus it is muddy from the first; hence the difference between this and urine containing lithate of ammonia, the latter only becoming muddy after a certain time. Phosphatic urine is also muddy when passed, but in this case it is much paler; and after standing some time there is a deposit as in the case of pus, but in phosphatic urine it is white instead of being yellow, and flocculent and light instead of being thick and heavy. A little acid renders phosphatic urine clear, while if pus be present it in-

creases the turbidity. In cases of phosphatic deposits also the urine is generally alkaline; in purulent, the urine is generally slightly acid. The pus is also rendered glairy and stringy by liq. potassæ. Again, if the urine be rendered acid by applying heat, the pus coagulates. Lastly, examined by the microscope, it consists of two essential parts, liq. puris and pus globules, which are characteristic. (Dr. R. B. Todd, p. 101).

AFFECTIONS OF THE SKIN, &c.

Acne and Boils.—These, depending on similar states of the constitution, may be treated alike. Great success has been obtained at the Hospital for Diseases of the Skin, by the combination of ferruginous salts with saline aperients. In *acne simplex* and *punctata*, Mr. Startin prescribes ferri sulphat. gr. ij., magnes. sulphat. ʒ j., ter die. sumend.: an ointment of ammonio-chloride of mercury gr. x. ad. ℥ j., to be applied every night. For *acne indurata*, the iodide of iron in doses of gr. iij., three times daily. For the *furunculous epidemic*, so rife of late years, full doses of iron with saline purgatives—mist. ferri acid. ʒ iij. ter die. (Mr. J. Startin, p. 200).

Chilblains, *Broken.*—Use the "Baume Chiron de Lausanne," which is made as follows:—Olive oil, 10 oz.; Venice turpentine, 2 oz.; yellow wax, ½ oz.; boil together, strain, and add balsam of Peru 2½ drachms; camphor, 9¼ gr.; stir constantly until cold.

Unbroken.—Rub unbroken chilblains with the following balm night and morning:—Rectified sp. turpentine 1 drachm, sulphuric acid 15 grains, olive oil 2½ drachms; mix. (M. Cazenave, p. 201).

Eczematous Eruptions.—*Chronic.*—Apply cod-liver oil externally. (Mr. Paget, *Med. Times and Gazette, Jan.* 1, 1853, p. 23).

Erysipelas.—In the treatment of this disease by the employment locally of the tincture of iodine Mr. Norris arrives at the following results:—That its application over the whole of the affected part appears to exert a

specific control over the disease; that the earlier it is applied the more manifest is the result; and that as often as the skin becomes pale from the vaporization of the iodine it should be repeated, notwithstanding the somewhat severe smarting which ofttimes immediately ensues. (Mr. H. Norris, p. 194).

Apply the following to the skin:—Collodion 30 parts, castor-oil 2 parts; mix. Apply it once a day for three successive days to the parts attacked. A cessation of the burning pain and the disappearance of the redness take place. (M. Robert Latour, p. 194).

Gangrena Senilis.—Lessen the tendency to overaction by soothing means; confine the patient to bed; debar him from animal food in every form, with the exception of milk. Supply him with doses of morphia in proportion to his pain and restlessness. Avoid giving him stimulants, and cover the affected part with a linseed poultice. Under this plan the distressing symptoms gradually disappear, the slough ceases to extend, and the sore cicatrizes soundly. (Prof. Syme, *Monthly Journal, April*, 1853, p. 302).

Nævus.—Mr. Startin's new plan of treating these cases is by applying a ligature. The base of the nævus is surrounded by a subcutaneous ligature composed of a single thread, to the ends of which a band of india-rubber is attached. Elastic traction is thus kept up until the thread cuts its way out. It is not applicable to these two kinds of cases: 1. Where the disease is seated on parts which, being pendulous and not firmly fixed, cannot bear the necessary traction; such as the ear, the lips, and the genital organs. 2. When the nævus is purely cutaneous; for if the morbid vascularity be derived from the skin itself, it is obvious that division of the subcutaneous tissues will not cure it. (Mr. J. Startin, p. 158).

Scirrhus:—Give from one-eighth to one-fourth of a grain of ammonio-sulphate of copper three times a-day. It may be continued for many months. (Dr. H. Roe, p. 319).

Ulcers, *Indolent and Callous.*—Instead of employing the expensive and troublesome plan of strips of adhesive plaster, apply a large blister. This quickly relieves the hard swelling of the limb, and allows speedy healing and sound cicatrization without further trouble. (Prof. Syme, *Monthly Journal, April*, 1853, p. 301).

Cancroid.—Give from one-eighth to one-fourth of a grain of ammonio-sulphate of copper three times a-day. It may be continued for many months. (Dr. H. Roe, p. 319).

Varicose.—Apply simply the common black-wash lotion. Under this plan they generally readily heal. (Prof. Syme, *Monthly Journal, April*, 1853, p. 301).

Of the Face, Malignant.—Pour sulphuric acid on powdered saffron, and apply it in a soft state to the ulcerations. The paste dries and falls off in two or three days, and carries with it the eschar. It will be necessary to apply the paste several times. (M. Cazenave, p. 193).

Of the Leg.—The out-patients of the London Hospital are treated as recommended by Mr. Critchett, by strapping the whole leg from the toe to the knee with inch-wide strips of plaster, and applying a bandage as tight as can be borne. The plaster should be made of unirritating material, and spread on unglazed calico. In the London Hospital the emp. plumbi is used. At St. Bartholomew's, Mr. Wormald directs the application of a folded compress of lint over the trunk of the internal saphena, immediately below the knee, to be fixed with considerable tightness, by means of a broad strip of sticking-plaster. The same object is gained yet more effectually by Mr. Startin's elastic spiral bandage, as used at the Hospital for Diseases of the Skin, (see Vol. 23, p. 345). These ulcers are essentially of an inflammatory character, and the blistering the edges by some blistering fluid (Bulleyn's is the best) is often followed by remarkable benefit. At the Hospital for Diseases of the Skin the patient is put under a continued course of iodide of potassium, or biniodide of mercury, and the following ointment is applied to the ulcer:—Hyd. bisulphuret, hydrarg. nitric. oxyd. aa. ʒ ss.; creosote ♏xx.; adipis recentis ʒ xvi. Misce. (Mr. Critchett, Mr. Wormald, Mr. Startin, p. 197).

In an obstinate case of this disease, Mr. Gay, finding the skin immediately in the neighbourhood of the ulcer very tense, and unable to yield further to the contracting power of the scar, divided that part of the skin where the tension existed in the greatest degree. Three weeks after, the ulcer was quite closed. Mr. Gay observed that it was only by altering the direction of the traction and transferring it to more healthy and moveable parts, that any advantage can be expected from measures similar to the above. (Mr. J. Gay, p. 199).

Warts.—In the case of a girl affected with gastralgia, whose hands were covered with warts, carbonate of magnesia was given. Two months after, though the stomach affection was unaltered, the warts had disappeared. In another case, the same dose, a teaspoonful night and morning, produced a similar effect in five weeks. (Dr. Lambert de Hagueneau, p. 200).

Wounds, *Incised.*—For a long time these have been treated by the edges being brought together by strips of adhesive plaster, and the wound covered with pledgets of lint and tight bandages: in this way abscess was generally produced. Withhold all impermeable covering, but apply pressure diligently, so as to maintain the raw surfaces in apposition, so as to be within reach of the adhesive effusion by which their union is effected. (Prof. Syme, *Monthly Journal, April* 1853, p. 302).

AFFECTIONS OF THE BONES AND JOINTS, &c.

Bursa *of Flexor Tendons of Wrist.*—This affection sometimes renders the fingers quite useless: its removal was formerly considered impracticable. It may be cured easily and certainly by making an incision about an inch or little more in length, through the integuments and subjacent textures, including the annular ligament of the wrist. (Prof. Syme, *Monthly Journal, April* 1853, p. 302).

Caries *of the Ankle-joint.*—Amputation of the leg, below the knee, used to be the common operation for caries of the ankle-joint and bones of the tarsus; but when the

disease does not extend above the articulating extremities of the tibia and fibula, the foot may be removed, and the thick integuments about the heel preserved to form a cushion for supporting the weight of the body. Besides this, there is much less fatality about this operation than in that of amputation of the leg. (Prof. Syme, *Monthly Journal, April* 1853, p. 303).

Fracture *of the Femur.*—Mr. Butcher has introduced a most important and useful addition to the splint commonly termed Liston's. The principle is to keep the limb thoroughly extended, and thus to prevent the shortening more efficiently. This he has effected by means of a long screw, conveyed through a socket rivetted vertically on the side of the splint. The lower end of the screw terminates in a cylinder, which is received into the centre of a piece of wood underneath the splint. By a few turns of the screw, the splint may be elevated or depressed at pleasure, Another advantage is, that the splint can be readily reversed, the screw changed, and its adaptation to either limb be effected. It will be easily understood, however, if the reader turns to the drawing exhibiting this mechanism at p. 124.

Mr. Fergusson, at a meeting of the Royal Medical and Chirurgical Society, said, that the swinging apparatus, commonly used for fractures of the leg, was equally applicable for fractures of the lower part of the thigh, and also in fractures of the knee-joint. Mr. Luke thought, as a rule in fractures of the thigh, it would not be so useful, because both the fractured ends could not always be placed on the apparatus. Mr. Hodgson, the president, considered the swinging plan of treatment of great value in fractures of the patella. (p. 131).

Of the Leg.—In a case of this accident, where constant displacement of the bones was produced by the extreme spasmodic action of the muscles of the calf, after all means to remedy this state of things had been tried in vain, the tendo achillis was divided with the most complete success. (Mr. Birkett, p. 130).

Of the Thigh.—Perhaps the best mode of treating fractures of the thigh is to place the patient on such a bed as will admit of the back being elevated or depressed without at all interfering with the relative position of the thigh and trunk. Mr. J. T. Hester has invented such an apparatus, resembling in its various positions a double-inclined easy reclining chair, with means adapted to shorten or lengthen the part on which the fractured bone is placed. (p. 128).

[Dr. Wm. Highmore, of Sherborne, Dorset, has invented a new splint for fractures of the lower extremities, which is described and figured at p. 127].

VENEREAL AFFECTIONS.

Bubo.—When it is quite ripe pierce it in the most tense part, and in the direction of the ileo pubic axis, by a seton needle carrying four threads. The two apertures of entrance and exit of the needle must be formed beyond the perimeter of the inflamed skin. The pus is evacuated by gentle pressure, and the space between the openings is to be filled up with dossils of lint to keep up the compression. In the evening, the abscess is to be again emptied, and the pad re-applied. The process to be repeated twice daily. The threads should not be withdrawn until free discharge is secured. The time required for the cure is from 10 to 20 days. (M. Bonnafont, p. 202).

Gonorrhœa.—Inject a solution of tannin, ʒ ss. to ℈ ij. to ʒ ij. of water. The injection to be used three or four times a day. Ten cases were thus cured in from six to nine days. No pain followed its use. (Dr. Lange, p. 202).

Syphilis, *Secondary and Tertiary.*—If for primary syphilis mercury has been given, and for the secondary and tertiary forms the iodide of potassium, two effects are produced—1st, the compounds of mercury fixed in the body are rendered soluble and active; 2nd, a form is given them which allows their rapid elimination. In this case the patient suffers from the effects of mercury twice over. If no mercury has been given, then iodide of potassium will cure the secondary and tertiary forms of

syphilis by acting as a poison on its own account, which may be easily regulated according to the power of the patient. The dose to begin with in this case may be 15 grains a day, increasing it if the patient bear it well. (M. Melsens, p. 312).

Venereal Ulcer.—Instead of the violent treatment which has been commonly employed for this kind of ulcer—such as rubbing over the surface with caustic potass, and pushing it into the several sinuosities—apply a blister over the sore, and administer small doses of iodide of potassium to the extent of two grains twice or thrice a day. (Prof. Syme, *Monthly Journal, April*, 1853, p. 302).

The following is the composition of Plenck's Mercurial Balm for dressing venereal ulcers:—Mercury 1 oz., Venice turpentine $\frac{1}{2}$ oz., lard 3 oz., calomel $17\frac{3}{4}$ grains, elemi ointment 3 oz.; mix. (M. Cazenave, p. 201).

AFFECTIONS OF THE EYE AND EAR.

Artificial Tympanic Membranes.—In 30 or 40 cases where the membrana tympani had been perforated, and in consequence of which the sonorous undulations did not strike the tympanum with sufficient force, Mr. Toynbee, with great benefit, closed the tympanum by artificial means. To construct these artificial membranes he used thin layers of vulcanized india-rubber or gutta-percha. The septum was passed down, and adjusted by means of a fine wire or stem of some other material. All symptoms of inflammation should be carefully reduced before they are applied. (Mr. J. Toynbee, p. 206).

Deafness, *Atonic*.—Drop 5 drops of the tinct. guaco into the ear, secured by a small plug of gutta-percha, coated with collodion. Three drachms of the tincture also may be diluted with six ounces of water. Two tablespoonfuls to be taken three times a day. In four days substitute cotton wool soaked in the tincture for the plug. If the hearing is deficient in both ears, follow the same plan with both. This treatment in a bad case of this kind, pursued for three weeks, restored the function of the ear. The tincture may be made by digesting

℥ ij. of powdered leaves in Oj. of sp. ten. for eight days, in a gentle heat, and afterwards filtering. (Dr. E. W. Pritchard, p. 322).

Ophthalmia, *Strumous.*—Smear the surfaces of both eyelids over with the solid nitrate of silver, previously moistening the lids. Painting the surfaces over with the tincture of iodine has also the same effect, and is perhaps more convenient. (p. 204).

MIDWIFERY AND THE DISEASES OF WOMEN.

Abscess *of the Breast, Chronic.*—The sinuses from this disease usually run in several directions through and behind the gland, and are very difficult to close. In a case under Mr. Birkett poultices were applied until the irritation was diminished, and then three grains of iodide of potassium in ℥ j. of infusion of gentian was taken three times a day. The breast was wrapped in lint spread with ung. plumbi iodini, and the whole supported by a bandage. In a fortnight afterwards all the sinuses were injected with the tinct. iodini by means of a tube carried to the end of the sinus. In three weeks afterwards the sinuses had completely healed. If the skin of the nipple in a pregnant patient should be found delicate, Mr. Birkett advises the application daily of alum wash, or some other astringent. This plan will prevent irritation following. Sometimes milk abscess depends on the non-development of the nipple. In this case a shield should be provided beforehand, and the patient properly instructed as to its use. (Mr. J. Birkett, p. 257).

Chapped Nipples, *Balm for.*—Olive oil, ℥ x.; Venice turpentine, ℥ ij.; yellow wax, ℥ j.; alkanet root, ℥ ss.; boil together, strain, and add of balsam of Peru, ʒ ijss.; camphor, 9¼ gr.; stir constantly until cold. (M. Cazenave, p. 201).

Dysmenorrhœa.—These cases may be treated by borax, along with a stomachic, as by the following formula:—Magnes. carb., 5 grains; pulveris rhei., gr. ij.; sodæ

biborat, gr. x.; infus. calumb., ℥j. If sickness is produced, acid. hydrocyan. dil. ♏ij., may be added to the dose. Emp. ammon. c. hydrarg. may also be applied to the loins. The class of cases to which the treatment by borax seems to be specially adapted are those in which no organic disease exists, but which, occurring in tolerably robust subjects, are attended by slight pyrexia, pain in the loins, the expulsion of flakes and shreds of lymph, and the other signs of a disease of active congestion rather than mere nervous derangement. (Dr. J. Henry Bennet, p. 251).

Hemorrhage *after Delivery.*—In several cases which Dr. Ramsbotham has met with there have been most severe after-pains, with great hemorrhage, though the uterus was still firm and comparatively small. His explanation is, that a clot having filled the cavity of the uterus, the womb is unable to expel the offending mass. The more fluid parts are squeezed out, and the firmer remain behind, clinging with such tenacity to the uterine walls as to be almost as difficult of removal as a piece of adherent placenta. The treatment of such cases is to introduce the hand, remove the clot from the cavity of the uterus, and immediately the after-pains and the hemorrhage dependent thereon will cease. (Dr. F. H. Ramsbotham, p. 225).

Labour, *Difficult; Forceps in.*—From the experience of several cases of difficult labour, Dr. Murphy asks, Whether, in the ovate deformity of the pelvis, we are justified in perforating the head and destroying the child, when the head is fixed in the brim of the pelvis? This question, he thinks, may be answered in the negative. Again: When the head has not entered the brim of the pelvis, what amount of space in the conjugate axis will justify the attempt to save the child, either by the long forceps or by turning? Dr. Murphy thinks we may do so if it exceed $2\frac{1}{2}$ inches. (*Association Medical Journal, March* 18, 1853, p. 229).

Tedious.—The use of the tartrate of antimony in tedious labours is by no means a secret among accoucheurs. Mr.

Stedman mentions several cases, amongst a very many, in which he has found it of benefit. His mode of giving it is a quarter of a grain every half hour, along with ten grains of nitrate of potash. The first dose usually produces sickness. (Mr. J. Stedman, p. 223).

Menorrhagia.—During an attack of the hemorrhage, let the patient take of ext. matico alcohol. gr. v., plumbi diacet. gr. ij. M. ft. pil. ij. quartis horis. ℞. Secalis cornuti, sodæ biborat. aa ℈j., mist. acaciæ ʒ ss., aquæ cinnam. ʒ iij. M., ft. haust., sumat demid. cum pilulis. Mr. Hooper prepares a combination of the diacetate of lead with the spirituous ext. of matico, than which no styptic appears more powerful. (Dr. Rigby, *Med. Times and Gazette, Nov.* 20, 1852, p. 509).

Premature Labour, *Induction of.*—The following is the method of Professor Kiwisch:—A piece of india-rubber tubing, about eleven feet long and half an inch in diameter, is connected with a straight tube from an injecting apparatus five or six inches in length, the latter forming the extremity of the syphon. A vessel containing about two gallons of water of about 110° Fahr. is placed nine or ten feet from the ground, the patient being placed in an empty hip-bath. The proper end of the tube is to be passed into the vagina, and directed towards the os uteri, where it is to be held steadily. After exhausting the tube, the other end is to be placed in the warm water. The stream flows with considerable force against the os uteri, and continues until the whole contents of the vessel are discharged. Two gallons of cold water are then to be placed in the vessel, and discharged in the same way. The douche may be repeated if necessary on the next day. (Dr. W. Tyler Smith, p. 211.)

In another case the plan adopted was somewhat different. The common elastic bottle-syringe, manufactured by Robertson, of Dublin, was used. To this was attached a flexible tube, with a bone pipe at the end. This was introduced into the vagina, and directed against the os uteri. Tepid water was then forced, by means of the syringe, along the tube, from some convenient vessel,

another smaller one being placed to catch the water as it pours from the vagina. The process had to be continued about five minutes. A second and third application was made on successive days; and on the third, labour came on at half-past three o'clock p.m., and terminated at half-past ten at night. (Dr. Shekleton, p. 214).

Polypus Uteri.—In applying a ligature upon a polypus of the uterus, we might grasp some of the structure of the uterus itself. To obviate this, the neck of the polypus must be tied some distance below its attachment; for that portion of the stem left in connexion with the uterus will wither and come away in shreds, or be absorbed after the main bulk has been removed. The sensation of pain must, to a great extent, be our guide. If the patient complains much, the noose should be relaxed, and again drawn tight over the lower portion of the neck or body of the uterus. (Dr. F. H. Ramsbotham, p. 255).

Prolapsus *of Anterior Wall of the Vagina.*—This condition is one of the causes in females of fetid-phosphatic-mucous urine. Dr. Golding Bird describes several cases he has met with, in which the cause had been overlooked. In one his brother, Dr. Frederick Bird, applied the actual cautery to the anterior portion of the vagina. After the slough came away, the contraction was sufficient to prevent the formation of the vesical pouch, and the result was most satisfactory. In another case the condition of the patient was relieved by introducing an injection of infusion of galls three times a day into the vagina, wearing an abdominal support with a perineal pad, and the administration of quina and iron with dilute phosphoric acid. (Dr. G. Bird, p. 243).

Rupture *of the Perineum.*—The plan of Mr. Brown's operation is as follows:—Having made a clean incision into the vagina, so as to separate from each side of the rent any portion of mucous membrane, three or four sutures were passed deeply through the parts, and attached to a piece of quill or elastic bougie on each side. Three or four smaller sutures might be passed also through the edges of the wound, so as to bring them into more certain apposi-

tion. To prevent the inner edges of the wound being drawn separate by the sphincter, and the lochia allowed to penetrate into the wound, Mr. Brown divides this muscle; and this he considers one of the most essential features of his operation. In all cases he administers opium, which allays the irritability of the nervous system, and exercises a most salutary influence over the patient. He has never seen any harm arise from its constipating effects. (Mr. I. B. Brown, p. 247).

MISCELLANEA.

Anthelmintics.—From some minute researches into the action and relative value of anthelmintics, the author advises that santonine should be given as a vermifuge, mixed with oil, in the proportion of from two to five grains to an ounce of castor oil. A teaspoonful of this should be given until an effect is produced. As auxiliary treatment, chloride of sodium, herring brine, mustard, onions, and garlic, may be employed. (Dr. Küchenmeister, p. 96).

Bites *from Serpents.*—Rub the parts with the tincture of guaco, and give ʒj. doses every ten minutes. This remedy is said to be unerring in its efficacy. (Dr. E. W. Pritchard, p. 322).

Ferro-Manganic Medicines.—[For M. Petrequin's remarks on the diseases for which these medicines are useful, see p. 443. The formulæ for the various preparations will be found at p. 445].

Goulard's Balm *(Oil of Saturn).*—Take of rectified sp, turpentine any quantity, heat it *secundum artem*, decant, &c. Used for dressing phagedenic ulcers, ecthyma, some chronic eczemas, and rupia. (M. Cazenave, p. 201).

Mercury, *Administration of.*—After mercury has been given for some time, a portion of it would seem to be retained in the system in the form of some insoluble compound. If iodide of potassium is now given, it combines with the mercury, forming a new and soluble salt

dissolving out the mercury, and setting it once more afloat in the circulation. This new salt, a double iodide of mercury and potassium, is eliminated from the system along with the excess of iodide of potassium, so that the cure would then seem to be radical and complete. (M. Melsens, p. 307).

Poisoning *by Laudanum.*—In a case of this kind, in an infant, the most beneficial effects were produced by the stimulus of galvanism kept up for a period of four hours, with intervals of different duration, immediately reapplying it when respiration seemed inclined to fail. One of the conductors was employed over the epigastrium, and the other conductor being taken in the right hand, one of the fingers of the left was placed in the mouth of the child between the teeth and gums, and as far back towards the fauces as convenient. The lowest intensity of current was used. (Mr. G. Kirk, p. 319).

By Lead.—Neither sulphuric acid nor sulphates can serve as antidotes to slow poisoning by the salts or compounds of lead, the sulphate of lead being itself a slow but sure poison, capable of killing vigorous dogs in twenty or thirty days. (M. Melsens, p. 309).

Mercurial.—It is important to know that iodide of potassium renders medical treatment in poisoning by certain salts of mercury more active, and may, therefore, occasion accidents. M. Dumas recommends, that when calomel (the chloride of mercury) is taken, and is wished to remain as such, common salt (chloride of sodium) should not be taken. When corrosive sublimate is taken (the bichloride), to prevent its being decomposed, sal ammoniac (the hydrochlorate of ammonia) is to be given with it. If doses of calomel are given to two dogs, and at the same time iodide of potassium given to one of them, the dog so treated will die first. (M. Melsens, p. 311).

Chloride of sodium (common salt) would seem to be of value in preventing the attacks of mercurial poisoning. Those workmen who are exposed to its influence, and who are fond of salt, resisting the contamination longer than those who are not. (M. Melsens, p. 307).

PRACTICAL MEDICINE,

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

Art. 1.—ON EPIDEMIC DISEASES.

By Dr. W. B. Carpenter.

[One of the most interesting papers we have lately read is by Dr. Carpenter in the 'British and Foreign Med.-Chir. Review' on the abovenamed subject—for though professing to be a review of the work of Dr. Marchal 'On Epidemics,' Dr. Carpenter, in the interesting subject before him, almost forgets his author, and gives us the most recent information on the subject gathered from his own and the experience of others. He begins his paper by considering the predisposing causes of epidemics, which are as necessary to their existence as the exciting causes, or the poisons themselves. Cholera poison would not affect a person whose system was perfectly healthy. There must be a susceptibility to its influence. What is this susceptibility? What are these predisposing causes? The answer of Dr. Carpenter is most interesting, and, to us, most satisfactory. He says,]

Experience has shown that what is true of cholera, is true also of a large number of other diseases of the same class; the causes which engender a special liability to one, being equally efficacious in producing a similar liability to another: so that we have a strong presumption that the *cause* of the invasion of epidemic disease in each individual case, may be expressed by this simple formula,—a certain general condition of the human body, *plus* the specific poison of the particular disease. When these two antecedents are concurrently present, the disease is invariably produced; when either of them is wanting, the disease cannot be developed. And we may thus prevent its invasion no less effectually by preventing the occurrence of the predisposition, than by preventing the development of the poison itself. Now as the conditions of the former are for the most part both certainly known and readily within our reach, our first attention ought surely to be given to them; the other question, however, being not disregarded, although less capable of an immediate solution. Towards this solution, however, we shall have made an important step, if we can clearly determine that condition of the system which is essential to the operation of the morbid poisons;

since we thereby gain a clue to the nature of that operation, which may be of great importance in leading us to a precise knowledge of it.

Now we believe that we shall be able to show, that all the recognised predisposing causes of epidemic disease tend to produce, in the blood of the individuals exposed to them, an excess of those decomposing organic compounds, which, as physiology teaches us, are always present in the circulating current, in minute proportion; being conveyed by it, from the spots in which they are introduced, or in which they are generated, to the organs through which they are to be eliminated. Such an excess is manifestly producible, either by the direct introduction of these matters from without, in the food or drink consumed, or in the air respired; or by the production of them within the body, at a rate beyond that at which they are normally eliminated; or by some obstacle to their elimination, which prevents the amount ordinarily generated from escaping at its normal rate through the usual outlets. And as we shall find that to these three categories all such causes may be referred, we have very strong ground for the belief, that the condition of the blood to which we have alluded, is that which, in concurrence with the specific poison, affords the invariable antecedent of which we are in search.

[All epidemic diseases generally classed under the term 'Zymotic' belong to one family in this respect—that they act upon the blood like ferments. A *ferment* is an azotized substance undergoing putrefaction and capable of exciting analogous changes in certain substances brought into contact with it. These substances may be azotized or non-azotized —if the former the ferment reproduces and multiplies itself at the expense of the azotized material—if the latter they simply occasion that re-arrangement of their components of which fermentation consists, *without reproduction* of the fermenting material. This fact has been applied to explain the reason why certain diseases, as hooping-cough, occur only once in a life-time; some special fermentible element being considered necessary to exist in the blood before the zymotic ferment can take effect. The existence of a second or third attack depends upon the fermentible matter being reproduced in the blood.]

Our general proposition when stated (so to speak) in the terms of the zymotic theory, amounts to this:—that all the recognised predisposing causes of zymotic disease tend to produce in the blood an undue accumulation of azotized matter, already in a state of *retrograde metamorphosis* and therefore precisely in the condition in which it is most readily acted on by ferments; that the presence of such matter is absolutely requisite, in the great majority of cases, for the morbific action of the zymotic poison, which has no direct action upon healthy blood, all whose components are in a state of progressive metamorphosis; and that the liability of each individual, among a number who may be concurrently exposed to the same poison, will mainly depend upon the degree in which his blood may be charged with the matters in question.

The first indication which we shall adduce, of the actual existence of this hypothetical entity, is that which first suggested the doctrine to our own minds; namely, that peculiar liability of the *puerperal* female to become the subject of zymotic disease, which affords the plainest evi-

dence (if the zymotic theory have any truth whatever) of her peculiar susceptibility not merely for the reception, but for the further development, of poisons of the zymotic kind.

[This point is sufficiently well established from the circumstance of the undoubted conveyance of puerperal fever from one patient to another by the person of the medical attendant. Further—erysipelas, typhus, and scarlatina poisons coming in contact with puerperal patients, frequently produce pure puerperal fever poison. Even putrescent effluvia surrounding lying-in-hospitals or being blown towards them by the wind have produced an epidemic of this fatal disease. It is supposed that the special potency of the poison in the puerperal female is because the tissue of the womb is in rapid disintegration; fatty degeneration is going on in its muscular structure, as proved by the fat globules in the lochial discharge and in the urine of the patient.]

We look upon this degeneration as only a peculiar case of that which is constantly taking place in muscular tissue as a consequence of its functional activity; for although we may not yet be in a condition to specify the precise nature of the chemical changes which occur in it, there is adequate evidence that these changes involve the ultimate production of two classes of *complementary* compounds; on the one hand, a *non-azotized* series, including sugar, fat, and lactic acid, which are destined to be eliminated by the respiratory process; and on the other, a *highly-azotized* series, of which creatine and urea are among those that are first traceable, and to which the kidney affords the appropriate channel of exit After the mighty effort which the uterus has made in the expulsion of its contents, rapid disintegration of its substance occurs: and there can be no doubt that, as the *complement* of the fatty compounds which are generated more abundantly than they can be carried off by the respiratory process, there must also be produced an equivalent amount of highly-azotized compounds; such as, until they have assumed the comparatively permanent forms of urea and creatine, must be, like the azotized matter of sweet-wort, peculiarly susceptible of having their constitution entirely altered by the action of a ferment.

[The remarks made above apply equally well to the contagious form of fever, recently noticed by Dr. Simpson, which has been termed surgical fever; indeed, the puerperal poison seems able to produce the surgical, and *vice versa*. But the cause of some of these zymotic diseases may be strictly without, and not within, the body; thus, the ingestion of putrescent food or water, the inhalation of air full of miasmatic emanations, are among the most powerful predisposing causes. Dr. Carpenter mentions an instance of this. All the persons who had partaken of a quantity of oysters in a state of decomposition were taken ill with choleraic symptoms, and eleven of them died. That the ingestion of decomposing matters in the water used as drink will produce a liability to these forms of disease is proved from the following extract from the Cholera Report of the Board of Health:]

"In Manchester a sudden and violent outbreak of cholera took place in Hope-street, Salford. The inhabitants used water from a particular

pump-well. This well had been repaired, and a sewer which passes within nine inches of the edge of it became accidentally stopped up, and leaked into the well. The inhabitants of 30 houses used the water from this well; among them there occurred 19 cases of diarrhœa, 26 cases of cholera, and 25 deaths. The inhabitants of 60 houses, in the same immediate neighbourhood, used other water; among these there occurred 11 cases of diarrhœa, but not a single case of cholera, nor one death."

In this instance, it seems impossible to avoid the conclusion, that the impregnation of the system with the putrescent matter thus insidiously introduced, determined not merely the selection of individuals by the cholera poison, but the terrible fatality of the disease in those attacked by it, *only one out of twenty-six having escaped.* We could cite, from the same Report and its Appendices, many other cogent examples of the same kind, several of them extending the evidence to zymotic diseases of different forms; but such of our readers as may not be satisfied upon this point can easily refer to these sources of information; and we shall confine ourselves to the mention of a case which occurred within our own knowledge. In a certain terrace, in the most aristocratic suburb of a large provincial town, consisting of houses of a superior class, and very favourably situated as regards free access of pure air, an epidemic of gastric fever broke out, a few years ago, much to the astonishment and dismay of the residents, no such malady having been known to prevail in the neighbourhood within the memory of "the oldest inhabitant." It was soon observed, however, that this epidemic was limited to particular houses; and, further, that whilst in some houses whole families were more or less affected by it, in others only the servants were attacked. Now, the water-supply of this terrace was in part derived from a neighbouring well, and in part from a deep spring at a distance; the latter, however, being paid for, was by no means universally employed, although much preferred as a purer water; and thus, whilst some of the houses only used the spring-water, others only used the well-water, and in others, again, the spring-water was employed in the parlour, the well-water by the servants in the kitchen. For some little time before this outbreak of fever, a disagreeable taste had been observed in the well-water; and this was subsequently traced to the bursting of a sewer, which had discharged part of its contents into the well. The houses *first* attacked by the fever, were those in which only the well-water was employed; and it was where the use of well-water was limited to the servants of the family, that they alone were at first affected by it. There appeared reason to think that some of those who had not used the well-water became the subjects of the malady by subsequent communication with those first affected; but there seems no reasonable doubt that the contamination of the water was the cause which originally determined the development of the zymotic poison in this locality, which has never again suffered from any such invasion, the faulty sewer having, of course, been repaired.

[*Miasmatic effluvia,* introduced into the system by pulmonary absorption, will produce the same result; for out of 120 persons inhabiting 17 roomy comfortable dwellings, 42 were attacked with cholera, and 30

died from no other apparent cause than abominably bad sewerage, and possibly contaminated water. *Famine,* again, is one of the most powerful predisposing causes of pestilence; for]

It is one of the most curious phenomena of starvation, yet one of which it is not easy to give a satisfactory explanation, that a state of general putrescence supervenes even during life; as if the want of material for the generation of new tissue were an obstacle to the deportation of that which has become effete.

An accumulation of disintegrating matter in the system may be due, not merely to its excessive production, but to any obstacle which interferes with its due elimination; and this will be especially the case, when the respiratory process is imperfectly performed. All physiological and pathological evidence tends to indicate the paramount importance of this process; not merely as regards the direct elimination, through the lungs, of a large amount of matter which is undergoing change; but also as furnishing the conditions, by which the matters properly to be excreted by the kidneys, are brought into the normal condition for being thus eliminated. For any prolonged deficiency of respiration necessarily lowers the general oxidating process throughout the body; and thus it happens that an undue amount of carbonaceous matter is thrown upon the kidneys for excretion, and that the highly-azotized compounds are not so completely brought, as they should be, into the condition of urea. Now, that *overcrowding*, and consequently deficient aëration of the blood, is one of the most frequent causes of the severity of epidemics, is a fact so universally recognised by all who have attended to the subject, that we need scarcely do more than advert to it.

The evil results of an insufficient supply of air are not exerted merely through the imperfect oxidation and elimination of the substances which are undergoing decomposition within the system; for the same cause will operate to confine the putrescent effluvia that are given off *as such* from the lungs and skin, which will produce the same effect upon the individuals habitually exposed to them, as if these were generated from some external source. It was ascertained by the experiments of Collard de Martigny, that the fluid exhaled from the lungs is by no means pure water, but contains as much as three parts in 1000 of organic matter. If this fluid be kept in a closed vessel, and be exposed to an elevated temperature, a very evident putrid odour is exhaled from it; and from the recent experiments of Mr. R. A. Smith, it appears that its putrescence depends on the decomposition of an albuminoid substance. There is every reason to believe that the fluid exhaled from the skin is charged with a very similar substance; its presence being indicated by the foul odour of garments that have been too long worn. And thus imperfect ventilation becomes the means, not only of preventing the due elimination of decomposing matter from the body, but actually of re-introducing its poisonous products into the blood, by the very process which was designed for the purification of the vital fluid. It seems, moreover, quite legitimate to conclude, that when the normal oxidation of the decomposing matter is prevented, the amount of that matter excreted in a state of imperfect oxidation will be increased; just as a lamp or fire smokes, when there is not enough air to support a perfect combustion.

Among the predisposing causes which promote the spread of epi-

demics, *intemperance* is admitted to hold a high rank. Its efficacy has been generally attributed to the general disorder of the nutrient process, and to the weakening of the vital powers, which it tends to induce; but to us it appears that it possesses a more direct and special action. One of the best-established among the consequences of the introduction of alcohol into the blood, is its rapid oxidation, whereby it is itself eliminated from the circulating current; but, in thus greedily appropriating to itself the oxygen which the respiratory process supplies, it *prevents* the oxidation of other substances, of which it is one of the special objects of that process to get rid; thus tending to induce the same condition of the blood as that which is consequent upon obstructed respiration. And the peculiar potency of this cause in hot climates, where the oxidating process, as measured by the production of carbonic acid, does not take place at above half the rate at which it is carried on in a colder atmosphere, is a strong confirmation of this view.

[*Fatigue* from excessive muscular exertion must be ranked with the other causes.]

All muscular exertion, it is now universally admitted, involves as its condition a disintegration of muscular tissue, the components of which normally undergo oxidation, so as to be partly eliminated by the respiratory process under the form of carbonic acid and water, and partly by the kidney under that of urea, &c. Now, if the disintegration of muscle by exercise take place faster than the matter thus set free to decompose can be oxidated and eliminated, it must remain in the blood for a time, in that very state of readiness to change which renders it peculiarly fermentible; and thus its presence in the circulating current will give to the blood the same susceptibility to the action of zymotic poisons, which it will derive from any of the causes already mentioned. And that this is the true *rationale*, seems to us to be strongly indicated by the fact which lies within the experience of every one, that muscular exertion so much more speedily induces fatigue in a warm atmosphere than in a cold one; and also by the fact, which is a matter of common notoriety in India, that troops on a march are peculiarly liable to suffer from fever, cholera, dysentery, or other zymotic diseases. For in proportion as the oxidating process is reduced in activity by a high external temperature, in that proportion must the products of the muscular disintegration tend to accumulate, inducing the feeling of fatigue by the deterioration of the blood to which their presence gives rise; and in like manner occasioning an extraordinary fermentibility in the circulating fluid, which renders it peculiarly ready to undergo a morbid change when any zymotic poison is introduced into it. Now, if this view be correct, we should expect to find the predisposing power of muscular exertion peculiarly augmented, either by any obstacle to free respiration, or by the ingestion of alcoholic liquors which will diminish the efficacy of that respiration. And such is undoubtedly the case.

[This is remarkably proved from instances of regiments, when performing forced marches, being singularly liable to zymotic diseases. In these cases, there is great waste of muscular tissue; and frequently the due elimination of decomposing products is prevented by alcoholic excesses.] —*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 150.

2.—ON THE INFLUENCE OF HUMAN EFFLUVIA.

By R. D. Grainger, Esq.

[In a paper read before the Epidemiological Society, in introducing his subject, Mr. Grainger makes the following very startling proposition:—That the same deleterious agents operate as predisposing causes in regard to the whole class of zymotic diseases; that the same agents which will develope the exciting cause of fever will develope also scarlatina, small-pox, diarrhœa, or cholera. He then proceeds to say,]

"According to my observation, the most injurious of all the causes operating on the diffusion of epidemic diseases, are the effluvia proceeding from the human body, particularly from the lungs and skin. The special deleterious agent consists of the effete, and as it has been proved experimentally, highly putrescent organic matter, mingled with the expired air. That it is, when re-introduced into the living body, highly injurious, might be inferred from the very fact of the careful provision made by nature for its incessant elimination from the system. That it is small in amount is no objection to the intensity of its action; for, to the physiologist, it is well known that a minute quantity of a powerful agent—the putrid matter introduced on the point of a needle in the inspection of a dead body, a single drop of concentrated prussic acid placed in the mouth of an animal, is sufficient to destroy life. It is in overcrowded bedrooms, in unventilated schools, workhouse dormitories, &c., that this effete matter taints the air, and, entering the blood, poisons the system. Although there is a great diminution in the amount of carbonic acid in the air evolved by the lungs, still the evil, quoad the development of fever, scarlatina, cholera, and so forth, depends on the organic, not the chemical, products of respiration." The learned author referred to some experiments proving the truth of this assertion. He then continued:—"It is, however, familiar to all practitioners, that human effluvia specially exhibit their poisonous influence when either multitudes of human beings are crowded together, or where a smaller number are placed in confined and unventilated sleeping places. Many instances of the influence thus excited on all kinds of epidemic disease have come under my notice, but only a few illustrative examples can here be adduced. The following case illustrates the effect of overcrowding in respect to cholera. During the epidemic of 1849, the inmates of a reformatory establishment for young women suffered intensely from the pestilence, 40 out of a total of 96 being attacked, and 15, or rather more than 15 per cent., falling victims to the disease. Now, these poor sufferers were previously in perfect health; they were well fed, well clothed, and carefully tended; but the dormitories were low and much crowded; the windows, for the sake of seclusion, were partly closed up, thus greatly interfering with the ventilation. After a careful investigation, I could detect no other cause than this for the sudden outbreak occurring at a period when there was little cholera in the neighbourhood. As regards the influence of overcrowding in the development of low fever, I may appeal to the experience of every medical practitioner whose duties call him much among the poor. It matters not whether we speak of the closely-packed common lodging-

house, of rows of houses built back to back, of the small, unventilated, and often single sleeping apartment of the mechanic, or of the ill-built cottages in rural districts, with their one bedroom, overhanging thatch, and small lattice; wherever, either from the presence of numbers, or the absence of ventilation, you have the fetid sickening air generated by human effluvia, there assuredly you will find fever. Although observed especially among the poor, fever, as it occurs in this country, is not especially dependent on poverty and destitution. Want may, indeed, aggravate the evil, and actual famine, as we unhappily saw a few years ago in Ireland, may give immense development to typhus; but that persons well fed, living in comfort, and strong in health, may suffer severely from low fever, is shown by a large experience. One of the best examples, perhaps, is furnished by the sailors belonging to the collier vessels frequenting the Thames. These men as a body are in the prime of life, robust, and well fed; but as I found by examining many of these vessels, the place where they sleep—the forecastle—is excessively small and confined, and with this serious additional evil, that as the hatchway is usually flush with the deck, whenever there is much sea, it becomes necessary to close the hatchway, where the unfortunate sailors must be without any window, as if shut up in a close box. When, too, the vessels come to London, as only one man is required to keep watch at night, all the sailors are crowded at the same time into their closely-packed berths. Some years ago the attention of Mr. Busk, the distinguished surgeon of the Seamen's Hospital Ship, was attracted to the large number of typhus cases which were admitted. In 1841 they amounted to 147; in 1842 to 167. It appeared that of all the vessels in the Thames the colliers furnished the most fever cases. In investigating this question I could detect no other cause than the polluted air these men must have breathed in the confined forecastle. That there is nothing connected with a sailor's mode of life to expose him to typhus is proved by the experience of well-managed vessels, and, as one among the many proofs which might be adduced, I may mention that Mr. Clark, who has made ten voyages to India as surgeon in Messrs. Green's fine vessels, had never had a single case of typhus." The author, after referring to the very great improvement in the health of those of the working classes who inhabit the model lodging-houses erected in different parts of the town by the Society for the Improvement of the Dwellings of the Labouring Poor, and to the high satisfactory working of the admirable Act carried by the exertions of the Earl of Shaftesbury for controlling common lodging-houses, said that his own experience of the deplorable conditions of these abodes corroborated the statements of Capt. Hay. All tended to show that such pestilential places were the habitats of disease, and the cause of enormous expense to the ratepayers.

"The effluvia from cesspools, when concentrated, afford a marked illustration of the principle already noticed, that any one of the predisposing causes of epidemic disease is capable, according to circumstances, of developing all the principal members of the class. But the extended inquiries of late years have shown, that affections of the abdominal organs are specially liable to be thus induced; gastric fever of a low

character, and often of the remittent type, vomiting, diarrhœa, dysentery, and cholera, are the constant results of what may be termed the privy atmosphere. In the city of Norwich it is a common custom, even in the most respectable houses, to have large cesspools in the cellar or basement, frequently of enormous size, some of them being 60, 80, or 100 feet deep. The effluvia were often most overpowering; and in every instance in which inquiry was made, I found that the inmates, and especially the children, who always suffer more than adults, had laboured under vomiting, diarrhœa, low remitting fever, &c., which were attributed by the medical attendants to the malaria thus arising." Several instances were adduced, which showed in a striking manner the depressing effects on the system, of exposure to an atmosphere impregnated with the effluvia arising from cesspools,—instances in which the mere removal of the contents of the cesspools sufficed to restore to a good state of health those who had previously suffered from exposure. Mr. Grainger then gave the history of the late attack at Southend which occurred in November and December last, and where, from the large quantity of rain that had fallen, and from the town being entirely unprovided with drainage, the lower parts of the houses, both of the upper and lower classes, had been flooded till the soil from the privies and water-closets had become mixed with the water invading the kitchens and basement floor. The water, indeed, had risen as high as the seat of the privy. Many of the first families were attacked, and several deaths occurred in some of the principal terraces, where the rents and taxes of unfurnished houses were often as high as £60, £80, or £100 a-year. "These instances plainly show, that wherever human beings, whether poor or rich, are exposed to the privy atmosphere for a sufficient time and in sufficient intensity, their health inevitably suffers, from a degree which is only called 'ailing,' to nausea, dyspepsia, and diarrhœa; or to low fever, usually of the gastric type, often remittent; to obstinate and fatal diarrhœa and dysentery; or, when present, to cholera."—*Med. Times and Gazette, Feb.* 26, 1853, *p.* 227.

3.—ON THE TREATMENT OF FEVER BY LARGE DOSES OF SULPHATE OF QUINA.

By Dr. A. Whyte Barclay, Medical Registrar of St. George's Hospital.

[The question in treating these cases by sulphate of quina is not so much whether tonics are not required, as it is whether, by giving large doses of the salt, we can cut short the disease, and prevent it running its ordinary course. There is no doubt that cases do occur in which it is perfectly powerless to prevent a fatal termination; still it is somewhat strange to learn that a patient may take two or three drachms of sulphate of quina in twenty-four hours, at the very height of a severe attack of fever, and yet suffer no harm from it.]

In watching these cases, one fact has been most striking and unmistakeable, and that is, the effect of the remedy when pushed to its full

extent: the pulse is depressed, the vital powers are prostrated, and vomiting follows. In some of the more severe cases there was such a tendency to sinking that stimulants were had recourse to, and seemed urgently called for. But this condition was by no means followed by a remission of the disease, which recurred as soon as the physiological effects had passed off.

One or two cases got well very speedily under its employment, in which general prostration was not produced, and its special effect, if any, was limited to lowering the general circulation. But it must be remarked, that, as we have no specific indications by which to measure the intensity of individual cases, so it is quite impossible to tell whether rapid convalescence in one or two instances was due to the treatment employed or to the milder character of the disease. And, though it is unquestionable that depression of the pulse is one of the physiological effects of this remedy, yet it must be remembered that the fever of the last six months has not been marked by any great frequency of pulse, and that in one or two instances the same remarkable slowness of pulse has been noted in rapid convalescence, under ordinary treatment. Consequently, when general prostration has not followed its administration, it may be doubted whether it was the cause either of the rapid convalescence, or of the character of the pulse.

Such considerations only render it the more necessary to take a comprehensive view of a large number of cases. The present series is, perhaps, not so great as might be wished, and certainly is not sufficient of itself to form the basis of a correct judgment of *all* the virtues of the remedy; but we cannot provide an epidemic at will for our experiments, and a knowledge of what it has already done, or failed to do, will best prepare for its judicious employment in future epidemics.

From among the cases of fever viewed with relation to their termination in recovery or death under different modes of treatment, it is needful to exclude such as were complicated with other diseases, as well as such as merely simulated typhoid fever, whether the resemblance was so great that, in the absence of any correct history of the case, its nature was left in doubt till after death, or whether it was merely regarded as fever, and treated as such until other symptoms arose to correct the diagnosis. Two cases of this nature, however, may be contrasted, in which the appearance of fever was exactly simulated by the low form of cerebral inflammation accompanying the tubercular diathesis. They each presented a quick pulse, hot dry skin, coated and dry tongue, relaxed bowels, with dark thin stools, and a muttering, unconnected delirium, without heat of head, or complaint of pain. The tubercles in the lungs were not much developed, and so equally diffused that no special indications could be derived therefrom. The cerebral symptoms were more marked than usual in fever, and in the one, for some days before death, were unmistakeable.

In one of these cases, quinine was given, in the other not; and while no surprise can be felt that it did not stay the inflammatory action, it is at least worthy of note, that no increase of the disorder seemed to attend its employment, that there was no hastening of the fatal result, no aggravation of symptoms.

The physiological effects of the quina were developed in this instance, and exactly corresponded to those noticed in the fever patients; the depression was perhaps not so fully marked; and there seemed to be considerable calming of the delirium. This may have been, however, only the transition from the delirious to the somnolent and semi-comatose stage of the disease. The duration and the intensity of those two cases, under such opposite modes of treatment, were very nearly similar.

It will be convenient also to allude to the only two uncomplicated fatal cases of fever which have occurred in St. George's Hospital during the six months under consideration. In one, the quinine treatment was employed; in the other, the ordinary method by salines, &c. Both were from the first severe. They were respectively eleven and twelve days under treatment, the whole duration in one being twelve days, and in the other seventeen days. That in which the saline treatment was employed died in a state of collapse, from the supervention of peritonitis, as was believed, after ulceration of the bowels and hemorrhage, but no *post mortem* examination was allowed. The one in which quinine was given, on the other hand, was one which bore all the marks of genuine typhus, as it is called, with the exception of the mottled rash, which was never seen, and it was quite a matter of doubt whether any decided fever spots existed, one or two very faint and fleeting marks on the abdomen being all that were observed. The tongue was brown, dry, and coated; there was very little diarrhœa and constant delirium, passing into stupor and coma; the face was much congested, and the eyes suffused. He died evidently from blood-poisoning, and the blood after death was very fluid, while only a few small ulcerations were found in the small intestine.

In this case the pulse was lowered for several days from 120 to under 100, but there was sickness and great depression attendant on the quinine treatment, which was twice employed, and had to be given up on each occasion in consequence of this effect. No benefit was derived from its use.

One of the cases which recovered presented the same train of symptoms, and, so far as could be ascertained in the absence of actual inspection, the bowels were not ulcerated; there was no diarrhœa, and the stools produced by castor-oil were generally of a pretty natural appearance; the tongue never became shining, glazed, or chapped: in this instance, too, there were no spots.

Cases of this nature have been rare during the last six months, the fever has been generally of a milder type, and, when serious complications have been noticed, they have generally been connected with evidence more or less distinct of ulceration of the bowels.

The cases treated by quinine may be divided into three classes:—1. Those in which its exhibition was followed by marked depression. 2. Those in which the pulse became slower, without general prostration or sickness. 3. Those in which no decided effect was produced which could be noted at the time.

1. Including all the cases together in which this effect was produced, the number is five. Two have been already mentioned as fatal, one of apparent typhus, one of tubercular inflammation of the brain, to which

a third may be added, complicated with albuminuria, which was not detected until the subsidence of the fever, and ultimately proving fatal. The physiological effect of the remedy was produced by very different quantities in different instances, and given at very varying intervals. One patient took twenty grains every three hours for nine times; another took ten grains every two hours for ten times; while a third took twenty grains every six hours for only three times; the other two had twenty grains every four and every six hours respectively for eight times.

Of the three uncomplicated cases, one died, one was ill ten days before admission, and remained under treatment forty-five days before recovery was complete; the other had been ill a week, and was discharged cured at the end of twenty-four days.

2. In two instances only did the pulse become remarkably slower without any depression; one took ten grains every three hours, the other fifteen grains every four hours for about two days, after which the dose was gradually diminished. The first had been ill five days, and was discharged cured in eleven days, having been kept under observation longer than was perhaps absolutely needed to ascertain that recovery was really complete; the second had been ill only two days, and got well in three weeks.

The first case was not severe, and had no spots; the second was delirious for the first two or three nights, and had a faint rather indistinct rash on the abdomen; he had also pretty severe diarrhœa, but no evidence of ulceration of the bowels. The pulse fell in each below 50, but it is necessary to state here, that in another instance it fell still lower in which no quinine was given. He made a very rapid recovery, being ill only five days before admission, and leaving the hospital cured in eight days.

3. In eleven cases there was no distinct physiological effect produced by the quinine; and it remains to inquire whether recovery was more rapid under this mode of treatment than any other; and this may be best accomplished by instituting a comparison between them and the whole of the other fever patients admitted during the same time. Twelve examples of a very mild form, which might be justly called febricula, are omitted, and there then remain 51 instances of well-marked fever which were not treated by quinine.

Among these, 20 exhibited fever spots on the chest or abdomen, and 6 with and 5 without spots gave unequivocal evidence of ulceration of the bowels. By this is not meant merely the occurrence of thin watery motions, which have been observed in the majority of the patients, but the persistence of diarrhœa, with a patchy, shining, or fissured tongue. We have, therefore, as the basis of our analysis, 26 cases, which neither had fever spots nor distinct evidence of ulceration, 14 with spots but not certain ulceration, and 11 in which the presumptive evidence of ulceration was strong.

The average duration of these cases was—of the 26 cases, 10 days before admission, and 21 days under treatment; of the 14 cases, 8 days before admission, and 22 under treatment; of the 11 cases, 7 days before admission, and 33 under treatment.

Turning now to those in which the quinine treatment was adopted, and almost invariably in ten grain doses every four hours, they include 5 cases in which there was pretty conclusive evidence of ulceration of the bowels, 3 of which were also spotted; 4 cases with spots, where ulceration was not proved; and only two in which neither condition was exhibited. With the last cases it may be best to classify the two already referred to under the second division, because they are not marked by any very broad line of distinction separating them from the present series, and they exhibit the quinine treatment under its most favourable view.

There are, therefore, 4 cases without spots or decided ulceration, of which the average duration was 8 days before admission, and 23 under treatment; 4 cases with spots only, of which the average duration was 10 days before admission, and 26 under treatment; 5 cases with ulcerated bowels, of which 3 had also spots, and their average is 15 days before admission, 37 under treatment.

I must here distinctly state, that when I commenced this report I had no idea what the result would be, and, so far from believing it unfavourable, had hoped that excluding some unfortunate cases, the treatment of fever with quinine would prove rather more speedy, safe, and effectual than by the ordinary modes. I am sorry to be convinced that it has no advantages.

It may be well to state in conclusion, that the prevalent type of fever has been what would be called "typhoid," not true "typhus." One or two had the aspect of congestive typhus, but wanted the purple, mottled rash. One patient had this rash very well marked, mixed with ecchymosed spots, and at the same time had distinct ulceration of the bowels, with a chapped and glazed tongue. Some had a very abundant crop of florid, slightly elevated spots, disappearing on pressure; some had only one or two of this character. Occasionally the spots are characterised as large, sometimes as small; and individual instances occur exhibiting various degrees of persistency, and various shades of colour, from a pale rose to a deep crimson. Spots existed without ulceration, and ulceration without spots, apparently without any definite rule; and some of the most severe and tedious cases were unaccompanied by either one or the other.

Without entering at present into the *vexata quæstio* of the exact value of fever spots in diagnosis, these facts are mentioned to show that the cases presented very considerable varieties, but I have not been able to ascertain that the quinine treatment was more adapted to one condition than to another. It appeared in the only two cases resembling typhus in which it was tried, that the depression was greater, and produced by a smaller quantity of the alkaloid, than in the remainder, but the instances are too few to draw any general conclusion from them. It is still a desideratum, that similar experiments should be made in the course of a regular epidemic of typhus; for, however otherwise the cases differed among themselves, they had this feature in common, that they were examples of the endemical fever of London.—*Med. Times and Gazette, Jan.* 8, 1853, *p.* 31.

4.—ON THE ACUTE SPECIFIC DISEASES.

By Dr. Wm. Jenner, Professor of Pathological Anatomy, University College; Physician to the Hospital for Sick Children, &c.

[From a consideration of Sydenham's proper or typical stationary fevers, Dr. Jenner imagines they may be defined as follows:—"Acute diseases of definite duration, capable of reproducing themselves, and attended in their course by disseminated lesions of structure." He considers, however, the order to be a more numerous one than Sydenham supposes. Small-pox, erysipelas, measles, typhus fever, scarlet fever, typhoid, and relapsing fever, are sufficiently well marked; but very likely cholera and some others, may ultimately have to be classed as species. Dr. Jenner also makes another order, which he defines thus: Acute diseases of definite duration, attended in their course by disseminated lesions of structure, *but incapable of reproducing themselves*; such are acute tuberculosis, acute purulent diathesis or pyogenic fever, and acute cancer. He then proceeds to point out the peculiarities of each species, necessitating their combination into one class or genus.]

1st. Of the general symptoms which precede the local lesions of structure, and during the whole course of the disease, are out of proportion to them in severity—rigors; abnormally high temperature; pain in the back and limbs; headache; mental disturbance; increased frequency of pulse; loss of muscular power, and general sense of illness; these, it may be said, are common to all, but still they present marked differences and peculiarities in regard of each of the species in question.

A severe *rigor* often ushers in an attack of small-pox, of erysipelas, and of relapsing fever. Rigors are very common, but rarely severe at the outset of typhus fever; they are of infrequent occurrence in measles and scarlet fever.

In typhoid fever rigors are replaced by a frequently repeated sense of chilliness. A rigor occurring so long after the outset of the disease as that which ushers in the relapse in relapsing fever, would, in typhoid fever, as has been proved by Louis, indicate the establishment of some serious local complication.

The *temperature* of the skin, which from the very first is much higher than in health in scarlet and relapsing fevers, is in typhus fever peculiar in kind—pungent, biting, but not particularly high. In small-pox it often, and in typhoid fever occasionally, falls considerably after the appearance of the eruption.

The severity of the *pain in the back* in small-pox is, as is well known, singularly great; in erysipelas it is often complained of a good deal. In typhus fever the pain is usually more severe in the limbs than in the back, while in relapsing fever it is commonly present and often severe in both situations. In typhoid fever, scarlet fever, and measles, the pains in these parts are generally from first to last trifling.

Present in all these diseases, *headache* varies in severity and duration in each. Thus in small-pox it is severe at the moment of invasion, but quickly disappears; in relapsing fever it continues through the whole of the primary attack and of the relapse; in typhus and typhoid fevers it is one of the more constant symptoms at the outset, and in both disappears spontaneously, but some days earlier in typhus fever than in

typhoid fever. Headache is by no means a prominent symptom in typical cases of scarlet fever or measles.

The *mind* in scarlet fever, measles, and relapsing fever is unaffected, or active delirium, mild in character, occurs at night.

In typhoid and typhus fevers the power of collecting, directing, and fixing thought first fails, then the power to appreciate the duration of time,—periods of time that elapse between given events are to the patient's imagination lengthened, minutes seem hours, hours days, and days weeks, and rarely, *if ever*, the reverse. In typhus fever this mental incapacity gradually merges into the lower form of delirium. The same happens in some cases of typhoid fever. Occasionally, however, as in small-pox, active delirium is one of the earliest symptoms in typhoid fever, and then, as in small-pox, it ceases when the eruption appears. This probably never occurs in typhus fever.

In small-pox and scarlet fever, measles and relapsing fever, the *general sense of illness* may be extreme; at the same time the patient loses the power of exerting to any considerable extent his muscular powers; he feels and is really weak. In typhoid fever, the loss of muscular power is yet greater; but it is in typhus fever that this is from the first the most marked. In small-pox, measles, scarlet fever, erysipelas, and relapsing fever, the patient ordinarily assigns as the cause for keeping his bed a sense of general illness. In typhoid fever, this is often the case; but in typhus fever, the all but constant reply to the question, Why did you take to bed? is, "Because I was too weak to keep about."

A *frequent pulse* is a symptom common to all the acute specific diseases,—one of their bonds of union; but it is also one of the grounds of their distinction.

In scarlet fever, the pulse at the very outset of the disease attains its maximum rate of frequency, continues at the same rate for a certain number of days, and then gradually falls.

In relapsing fever, the pulse also attains its maximum rate of frequency from the first, beats at the same rate for a certain number of days, and then suddenly falls to its rate in health, or below that. Again, after a limited number of days have elapsed, it suddenly doubles the frequency of its beats, and then a second time, after a limited number of days, falls below the standard of health.

I may remark here, with reference to the very slow pulse observed after the first and second stages of relapsing fever, that the extremely infrequent pulse is due not to any slowness of contraction of the muscular substance of the heart, for the first sound is not lengthened, but to the duration of the pause,—that each beat of the heart appears to be normal, but the time that elapses between the beats, is prolonged, *i.e.*, the pulse is really infrequent, not slow.

The reverse of this is true in reference to the length of the first sound of the heart, and the duration of the pause in some cases of slow pulse in cerebral disease.

Again, as to the ratio between the pulse and the respiration in these cases, the pulse being extremely infrequent, the respirations may preserve their ordinary frequency, fall very slightly, or be a little more

frequent than in health. So that, instead of bearing to each other the ratio of 1 to 4, the pulse is often little more than twice as frequent as the respirations, and the two may be almost equal in frequency; thus I have seen the pulse during the stage of convalescence from relapsing fever 36 only, when the respirations were 30 in the minute, no heart, lung, or cerebral disease being present.

The influence of change of position, of muscular exertion, on the frequency of the pulse in these cases, is illustrated by the following facts: the pulse being 48, the patient lying on his back, rose, on his assuming the erect position, to 116, the respiratory movements at the same time being scarcely more frequent than they were while the patient was in bed.

In typhus fever the pulse slowly rises in frequency to a certain point, preserves that rate of frequency for a variable period, and then as slowly falls. It is well here to remark, that whenever an increase more than may be accounted for by error in observation, *e. g.*, four or six beats in the minute in the frequency of the heart's beats occurs after the first fall in frequency in typhus fever, that increase is the precursor or accompanies the development of some complication. Thus in the sixth case tabulated, erysipelas commenced with the rise in the pulse. A sudden fall in the rapidity of the heart's beats in typhus fever is occasionally the consequence of intracranial disease, *e. g.*, hemorrhage into the cavity of the arachnoid.

In typhoid fever, the pulse rises and falls in frequency in a most irregular manner,—to day 120, to morrow 90, the next day 120,—and this apparently without any relation to the increase or decrease of the general or local affections,—without appreciable cause.

The different influence of free perspiration in diminishing the frequency of the pulse, in relapsing fever and in typhus fever, is illustrated by a comparison of this Table, which is copied from a Report on Continued Fever, by Dr. Flint, Professor of Medicine in Buffalo University, United States, and a Table compiled from my own observations in regard of the pulse in relapsing fever; for, in the cases there tabulated, the sudden fall in the pulse was preceded by profuse sweating:—

Influence of Perspiration on the Rate of Frequency of the Pulse in Typhus Fever.

No. of Cases.	Day before Perspiration.	Day of Perspiration.	Subsequent Day.
1	120	120 a.m. 116 p.m.	100
2	108	104	104
3	132	124	118
4	108	100	88
5	128	128	120
6	156	134	128
7	110	120	104
8	106	126	136
9	90	100	108
10	111	108	98

It is, then, manifest, that those general symptoms which the diseases of this class have in common, and the possession of which serves, in some measure, to prove their affinity, when closely examined, indicate their want of identity.—*Med. Times and Gazette, March* 5, 1853, *p.* 235.

[Dr. Jenner observes that in six out of seven of these acute specific diseases, the skin is the seat of disseminated vascular engorgement, these are, as before mentioned, small-pox, measles, erysipelas, scarlet fever, typhoid fever, and typhus fever. With regard to the seventh, relapsing fever, the same degree of uniformity of opinion does not exist. The following may be said to be the]

Peculiarities in Respect of the Parts of the Skin Affected.—The eruption in each of these diseases appears first on particular parts of the body, or limits itself throughout to particular parts. In small-pox and measles the eruption shows itself first on the chin, nose, or forehead, and thence invades the whole face. In small-pox the skin of the wrists next suffers, while in measles the rash gradually passes from the face to the neck, thence to the trunk, and subsequently to the extremities. In scarlet fever the eruption breaks out first on the root of the neck, upper part of the chest, loins, and outer aspect of the arms. In typhus fever, the back of the hands are the seat of the earliest spots; subsequently, the trunk and extremities; and it appears on these parts almost simultaneously. In typhoid fever, spots scarcely ever appear on the face, and rarely on the extremities. They are, perhaps, more numerous on the posterior surface of the trunk, but their characteristic appearance is best seen on the anterior.

In erysipelas, the inflammation commences about the centre of the face—*e. g.*, over the lower part of the nasal bones—the point of the nose, or the centre of the upper lip, or a little to one side of these parts.

As to the Period after the Outset of the Disease at which the Skin Affection appears, its Course, and Duration.—In relapsing fever, if there be a specific skin affection, it appears on the first day of illness; the rashes of scarlet fever and of erysipelas show themselves on the second; that of small-pox on the third; of measles on the fourth; of typhus fever on the fifth; of typhoid fever on the eighth. While in relapsing fever the duration of the rash is less than twenty-four hours; in measles, three or four days; in scarlet fever, six or seven days; in erysipelas, seven or eight days; in small-pox, ten or twelve days; in typhus fever, ten or twelve days; and in typhoid fever, twelve to twenty days.

In their course, these skin affections present certain peculiarities. Thus, in scarlet fever, measles, and small-pox the eruption disappears first from the parts first affected; so that in scarlet fever, for example, the legs are brilliant scarlet, when the face and trunk have resumed their normal tint.

The eruption seated on the back of hands in typhus fever often disappears in twenty-four hours, while that which studs the remainder of the surface continues of one uniform shade over the whole extent, to the last. In erysipelas, the inflammation of the skin spreads from one

spot gradually in all directions, ceasing to extend only with the cessation of the disease. Typhoid fever offers this peculiarity, that successive crops of spots follow each other at short intervals, the fresh spots being intermingled irregularly with the old, and the spots which appeared first never continuing till the close of the affection.

The scarlet tint of the rash in scarlet fever; its dusky red hue in erysipelas; its lake-like shade in measles; its mulberry aspect in typhus fever, and the rose colour of the spots in typhoid fever; the broad patches of eruption in scarlet fever and erysipelas; the circular, irregularly distributed spots in typhoid fever; the crescentic arrangement of the spots in measles and small-pox, and their orderless coalescence in typhus fever; the limited extent of the eruption in erysipelas and typhoid fever, contrasted with its wide diffusion in the other disease—these are characteristics of form, colour, and extent which need only, from our familiarity with them, to be mentioned.

In regard, then, to the skin affection in the diseases under consideration, we observe in each certain peculiarities in respect of nature, situation, date of appearance, colour, form, extent, and duration. With reference to the internal disseminated affections, the mucous membranes suffer the most markedly in scarlet fever, typhoid fever, erysipelas, and small-pox. In measles, however, it is the conjunctival, nasal, buccal, and bronchial; in scarlet fever and erysipelas, the faucial; in small-pox, the nasal, buccal, laryngeal, and tracheal; and in typhoid fever, the bronchial and intestinal. Again, the nature of the affection of the mucous membranes varies in each; in measles, it is active congestion, with abundant secretion from the membrane; in erysipelas, inflammation of a peculiar type, with dryness of the surface of membrane, and serous effusion beneath it; while in small-pox, the tendency is to suppuration; and in scarlet fever and typhoid fevers, to ulceration. In typhus fever, the mucous membranes suffer congestion only in common with other structures, if seated in depending parts of the body. Disseminated inflammations of the serous membranes are remarkably common in typhoid and scarlet fevers; comparatively rare in measles and typhus fever. Enlargement of the spleen is common in and to all; while in typhoid and scarlet fevers and erysipelas it is, especially, that the lymphatic glands suffer.

The *duration* of all these acute specific diseases is limited; neither lasts longer than a month, and many have completed their course long before that time. Not one of them continues more than a given number of days.

As to the mode in which this is determined, from the sudden commencement and abrupt termination of relapsing fever, and the fact that it is usually uncomplicated, there is no difficulty in fixing its duration.

The data for determining the duration of all the other diseases of this class are derived, *first*, from a consideration of the time that elapses between the first symptom of illness and the disappearance of the eruption; and, 2ndly, from a consideration of the appearances found after death. The eruption is one of the specific effects of the action of the exciting cause, *i.e.*, of the poison, seed, or other principle of infection, or of the condition of blood directly produced by that exciting cause, (and

its continuance is ordinarily equal in duration, after its first appearance, with that of the specific disease.) The length of the disease is then, at least, the period during which the specific eruption is present, plus the period occupied by the general symptoms anterior to the outbreak of the skin affection.

The second class of data for determining the duration is derived from the examination of the bodies of those who die of these diseases.

Thus, all these acute specific diseases are general diseases, and all may prove fatal without any lesion of structure of sufficient moment to account for death being found. Death results, that is to say, in a certain number of cases of each of these diseases, from the direct action of the poison which induces them, *i. e.*, from the change directly induced in the blood by that poison, or from the changes directly induced on all the tissues and organs of the body by that poison, or by the blood altered by that poison. Now, it is evident that death from this, or these causes, can occur only during the period that the disease itself lasts; therefore, if there be a period in each of these affections, *after which*, if death occur, changes of structure of sufficient moment or extent to account for death are always found, then the specific disease must be held to continue at least up to that time, whatever be the duration of the eruption. Now, experience proves, that in several of these diseases there is such a time, and has shown, moreover, that it is never later in each of the diseases than the time when the eruption fades in typical cases. Thus, the eruption of scarlet fever has disappeared in typical cases, by the ninth or tenth day of disease. If death occur in in scarlet fever before the latter date, then experience shows that in a certain proportion of cases, no appearances are found of sufficient importance to account for death; while, if death occur after that date, then death may invariably be explained by the lesions discovered. If in typhus fever, death ensue within twenty-one days after the first symptoms of illness, then may no deviation from healthy structure, such as experience proves to be capable of producing death, be discovered; while, after twenty-one days, extensive alterations of structure are constantly found.

If a case of typhoid fever prove fatal before the twenty-eighth day of disease, then may slight ulceration of the mucous membrane covering Peyer's patches, some enlargement of the mesenteric glands and spleen, be the only aberrations from the normal condition exposed by the most careful examination of the body; while, after the thirtieth day of disease, aberrations from healthy structure of the gravest character may always be demonstrated after death.

On the table are parts of the small intestines from two females, who died respectively on the fifth and fourteenth day of typhoid fever. In neither preparation is the intestinal disease very grave in character, yet scarcely any other change of structure was detected. For the one preparation I am indebted to my friend Dr. Sankey, and for the other to my friend and colleague Dr. Parkes.

It is, then, by a consideration of the period that elapses between the outset of the disease, when the invasion has been sudden, and the cessation of the eruption; and the period of the first symptoms, when also

the invasion has been sudden, at which, if death occur, no lesions of structure to account for death are to be found, that we determine the duration of the acute specific diseases.

By the aid of the latter of these two points, it is, especially, that we are enabled to separate the duration of the illness from the duration of the specific disease. Practically, in regard of some of these diseases, this separation is generally, because readily, effected; the duration of the specific disease being determined by the duration of the symptoms of invasion and of the eruption, the physician seeks for the complication by which the symptoms of illness are kept up. No one would say scarlet fever had lasted for seven weeks, because a person suffering from that affection had pleurisy established in its course, which pleurisy, passing into a chronic state, ran a course of six weeks. If such a case proved fatal, it would be at once admitted that the patient had died of a disease which had commenced during the progress of the scarlet fever, and continued after the latter had ceased. The same admission would be equally correct, even though the disease of which the patient died was one of those which, in a mild or severe form, invariably accompanies scarlet fever, *e. g.*, the throat affection; thus, in a case I saw lately, sloughing and ulceration of the fauces—established by the action of the specific disease—continued to progress after the latter had itself ceased, and ultimately caused the patient's death two or three weeks after the scarlet fever had terminated. I say, in regard of scarlatina and some other of these diseases, this separation of the duration of the specific disease from the duration of the illness is made, and consequently the former can have assigned to it as definite a duration in complicated as in uncomplicated cases,—in those unattended by an eruption as in those attended by an eruption. But in regard of typhus and typhoid fevers, the line in question has not been drawn, and we find, consequently, the duration of the latter said to be sometimes as much as sixty days, and that when no relapse has occurred. This confounding the duration of the illness with the length of the specific disease is an error into which I think some of the most able writers on these diseases have fallen. In typhoid fever, as in scarlet fever, there are two classes of lesions of structure discovered after death—1st, those which are invariably present; and, 2ndly, those which are more or less frequently the result of the disease. An instance of the former is ulceration of Peyer's patches; of the latter, pleurisy and pneumonia. Now, having been established in the course of the specific disease, either one of these may continue to progress after that has terminated, and all the general effects of ulceration of the small intestines, or of thoracic inflammation, be the result. The pulse may continue frequent, the skin hot, and the patient be delirious, and yet the fever may have ceased, the specific disease have terminated.

Determined by the data to which I have referred, each of the acute specific diseases has a definite duration, *i.e.*, with regard to each there is a date capable of being fixed absolutely, by which time the patient either dies, or, so far as concerns the specific disease, recovers.

The duration is different for each species; thus, for measles it is 7 or 8 days; for scarlet fever, 8 or 9 days; for erysipelas, about 14 days; for

small-pox the same, supposing in all four the eruption to have made its appearance on the typical day; while, without regard to the date of the appearance of the eruption, it is in typhus fever 21 days, and in typhoid fever 30 days.

If, therefore, health be not restored soon after these dates, we may be certain that some other than the primary affection is the cause of the continuance of the symptoms. And, again, if for either of these diseases a specific exist, or a special treatment be proper, it is manifest that that specific or that treatment can be expected to exert a favourable influence only during so many days from the outset of the first symptoms as the specific disease has been proved to exist.

The conclusion as to the duration of typhoid fever at which I arrived from a consideration of the points just referred to, has recently been fully confirmed by a consideration of a different class of facts.

Dr. Zimmerman lately published two papers in the *Deutsche Klinik*, on typhoid fever, He determined the duration of the disease thus: He noted the temperature of the patient daily, and found that the thermometer indicated that the fever ceased some time between the 21st and 28th days; that is to say, then, for the first time after the commencement of the illness, the thermometer being introduced into the mouth, the mercury stood at the point at which it stands when placed in the mouth of a healthy person. Up to the same date of the disease, the patient was proved by the balance to lose weight daily, while from that date he was proved to gain weight rapidly: thus, a patient who weighed before his illness 170 lb., on the 22nd day of disease weighed only 119 lb., and on the 26th day only 117 lb. On the 30th day he was found to have gained 3 lb., *i.e.*, he weighed 120 lb., and on the 39th day his weight was 124 lb.; no alteration in his diet of sufficient consequence to account for the increase having been made.

The last point common to all these diseases is, that they have a *specific cause*. But although all are capable of reproducing themselves, there is not one which does not sometimes arise under circumstances in which it is impossible to trace the existence of any source of contagion, —that is to say, there is not one which does not sometimes appear to arise spontaneously. But the frequency with which this happens differs considerably. It rarely happens that cases of small-pox, the disease not being epidemic, are unable to be traced to their origin. The inability to refer the disease to contagion is more common in respect of cases of scarlet fever, measles, and typhus fever. while the contagious nature even of erysipelas and of typhoid fever has been called in question. Nay, it was long held that typhoid fever differed from typhus fever for this reason among others, that while the latter was contagious the former possessed no power of reproducing itself. The memoir of M. Piedvache, 'Recherches sur la Contagion de la Fièvre Typhoide, et principalement sur les Circonstances dans lesquelles elle a lieu, par Joseph Piedvache, Paris, 1850,' has for ever laid this doubt. That observer has shown, that if the conditions of development be given, typhoid fever has the power of reproducing itself, and has adduced several instances in which persons in attendance on cases of typhoid fever not only contracted the same disease, but, having been removed while ill to houses situated miles

distant from the primary case, and where no fever existed, communicated the disease to their relatives and friends. As a rule, those only had the disease, who, in imperfectly ventilated rooms, were in close and continued communication with the sick man.

But let the cases of that disease collected together be numerous, and the attendant fully exposed to the effluvia, and it will spread among them in the best ventilated places as freely as typhus fever. For example, the number of nurses who suffered from typhoid fever during the time I visited the London Fever Hospital was as great as the number of those who had typhus fever, while, during the same time, one of the medical attendants had typhus fever, and just before one had died of typhoid fever.

It would appear that the seeds of these specific diseases differ from each other, like the seeds of plants, not only in requiring more or less different conditions for their development, but also in the facility with which their germinating powers are destroyed.

I cannot call to mind a single instance of a case of small-pox being received into the wards of a general hospital without the disease spreading to one or more of those in relation or proximity to it; while I can remember only two instances of the extension of typhoid fever when cases of that disease were scattered through the wards of a *general* hospital; and in these cases it was the friends of the patient—the mother, in one instance, who had watched by her son night and day—who suffered.

The following facts, given by Dr. Flint, of Buffalo, are of interest, as bearing on this point and some others connected with the means of the propagation of the contagious diseases. At North Boston, Erie county, United States, in 1843, resided nine families. Taking a tavern for the centre, seven of the nine lived within an area 100 rods in diameter.

All the inhabitants, with the exception of the members of one family, were in the habit of frequenting the tavern. A feud existed between the master of that one and the tavern-keeper. A man labouring under typhoid fever (a disease previously unknown in North Boston) took up his residence at the tavern, September 21, and died October 29th.

Between October 19th and December 7th, twenty-eight persons in this little community had typhoid fever. Three families only escaped the disease, viz., the two residing the farthest from the tavern, and that of the man who had a quarrel with the tavern-keeper, and who, consequently, never visited at his house. Now, a fact of interest in this case is, that all the families in which the disease appeared drew their supply of water from the well of the tavern, while two out of the three that escaped had their water from other sources.

The man at feud with the tavern-keeper was accused of having poisoned the well of the tavern. He resided nearer than any of the others to the tavern. None who visited the village simply for the purpose of rendering assistance to the inhabitants, contracted the disease.

In concluding this review of the typical causes of the acute specific diseases, I would observe, that, as the pathological tendency

of small-pox is to produce inflammation and suppuration;
of measles „ active congestion;

of scarlet fever is to produce inflammation and ulceration;
of typhoid fever ,, inflammation and ulceration;
of typhus fever ,, congestion and extravasation of blood;
of erysipelas ,, inflammation and effusion of serosity;

it is probable that the pathological affinity of typhoid fever is with scarlet fever rather than with typhus fever or relapsing fever; and that the pathological affinity of typhus fever is with measles rather than with typhoid fever or relapsing fever; while the symptomatological affinity of relapsing fever is with the class of diseases in which intermittent fever ranks, rather than with typhus fever or typhoid fever, although etiologically its place is among the acute specific diseases.

Small-pox.—I have already remarked, that the deviation from the type of small-pox in the confluent variety is due to the extent and severity of the specific local process.

Symptomatologically considered there are three, and pathologically considered two, distinct varieties of small-pox included under the term "malignant small-pox."

In the first symptomatological variety, the severity of the general specific disease is evidenced by the patient dying before any local disease whatever is established.

In the second, the severity of the general specific disease is manifested by the softened state of the solids, and the ready solubility of the organised elements of the blood; the effects of which are hemorrhage from innumerable small vessels in various parts of the body, the effusion of serosity dyed red by dissolved hæmatosin, and diminution of muscular power, cardiac as well as voluntary. The cerebral functions in these cases are often unimpaired.

While the third variety is characterised by so-called typhoid symptoms; *i.e.*, by frequent pulse, dry and brown tongue, low delirium, and great prostration,—characters which it owes either to the severity of the general affection, for they are sometimes present when the pustules are few in number and distinct,—or to the presence of severe local complications. Thus, in a case I witnessed of this kind, when the patient was progressing favourably, the evidence of pneumonia being established, was quickly followed by typhoid symptoms. On examination after death, the interlobular septa of the lung were found infiltrated over a considerable space with purulent-looking fluid.

Typhoid Fever.—The cases of typhoid fever met with in practice may be grouped under the following heads:—The typical, the mild, the grave, and the insidious, simulative, or latent.

Time permits me only to sketch the last; and this I shall do at some length, because I believe the cases included in it are often misunderstood.

The insidious, simulative, or latent variety of typhoid fever usually commences most gradually, the patient being altogether unable to say on what day he first felt unwell; nay, sometimes he cannot fix within a week or ten days the outset of his illness; rarely is he able to say what the first symptoms from which he suffered were. He seeks aid from the physician because he feels "poorly;" he deferred seeking aid before, because "he hoped to shake it off." His bowels have been, he says,

somewhat "out of order," his head has ached a little, and perhaps he has had trifling cough. He thinks he must have caught cold. Now and then, one or other of the symptoms mentioned are especially complained of. Less commonly, pain in the limbs and back are troublesome. The patient has not given up his ordinary employment, but he feels, as he describes it, "not up to it." He lies in bed as late in the morning as his occupations permit him; when he rises, feels weary and fatigued, and at night scarcely able to undress himself. His appetite is lost; more or less diarrhœa is usually present; sometimes, however, the bowels are constipated. The tongue is often large, pale, and but slightly furred. It is generally somewhat tremulous. If the case be not understood, the patient gradually growing less able to exert himself, ceases to leave the house, or, if he still goes out, it is for a short time only. The greater part of the day he spends in bed or on a couch. At night he is restless, and disturbed by thirst and a sense of heat,—"eaten up by fever," as he calls it.

In this state, if the case go on favourably, the patient continues one day better and another worse, but always losing flesh for about a month, and then he begins to mend, and after another week or two feels pretty well.

For many years some of these cases puzzled me much. A pulse somewhat quickened only, a tongue not greatly differing from that of health, and no marked heat of skin, trifling frontal headache, a little sonorous râle, and slight irregularity of the bowels, seemed local ailments altogether insignificant, and yet the patient continued ill, and often appeared worse to his friends than to me, for they saw him at all times, I only when he was aroused to exertion. I have supposed the case to go on well; but in some instances it terminates fatally by hemorrhage from the bowels, or perforation of the intestine, and then the patient dies in a few days, to the surprise of those who have watched the progress of the case.

In these latent cases, the physician has often but to be aware of the possible nature of the illness to detect it. The confirmation follows immediately on the suspicion; for, if the surface of the abdomen and thorax be carefully examined, in a large number of cases, the rose spots, which, when well marked, are as characteristic of typhoid fever as are the small-pox pustules of small-pox, may be detected.

But in a certain proportion of cases, on the most careful search, not the trace of a spot can be seen.

Still the diagnosis may usually be made with certainty. The conjunction of frontal headache with diarrhœa is rarely observed except in cases of typhoid fever; and if to these symptoms be added a sense of weakness disproportioned to that which might be occasioned by the diarrhœa, trifling sonorous râle, with a want of steadiness in directing or keeping up, even for a short time, trifling muscular effort, *e. g.*, a little unsteadiness of the tongue when fully protruded, a little wavering of the hand when the arm is extended,—the diagnosis of typhoid fever may be considered absolute, even though the heart's beats be scarcely quickened, the tongue be moist and almost clean, and the patient able to leave his room for the greater part of the day. Ordinarily, in the

cases of which I am speaking, the abdomen is somewhat more resonant than natural, a little "blown," as it is called, and gurgling, on careful manipulation, may be detected in the right iliac fossa; the splenic dulness, too, is extensive.

In some cases which commence as the one I have just sketched, after 16 or 17 days have elapsed, the febrile symptoms become more marked, and in a few days the tongue is brown, sordes collect about the teeth, and prostration is considerable; then the disease is said to run into typhus fever.

In other cases cough and sonorous râle are the most prominent symptoms, and then the patient may be supposed to be labouring under a mild but protracted form of bronchitis. A fourth set of cases, from the presence of redness of the tip and edges of the tongue, and the marked character of the intestinal disorder, are called by some "mild gastric-fever," or "muco-enteritis."

While, in a fifth set, the symptoms are so trifling that the patient and his friends resort for an explanation of his illness to those English disorders, a bad cold or an attack of the bile, while the medical attendant sees protracted influenza, irritative dyspepsia, or error in diet.

Scarlatina.—Passing by those forms of scarlatina which are never fatal, I will enumerate the apparent causes of death in the fatal cases I have examined.

For this purpose I may divide the cases into two groups, viz., those which proved fatal during the first week, and those which proved fatal after the first week. Of the first group some died before the appearance of the rash.

The following are the particulars of a case of this kind which came under my observation in 1851:—

A man, about fifty years of age, his wife, and three children, resided in two small rooms opening into each other, in an imperfectly drained house.

Between May 15th and 29th the woman and the three children were attacked with scarlatina. The man slept during the whole time in the same bed with his wife and sick children. On June the 1st, about noon, *i. e.*, after eating, drinking, and sleeping in an atmosphere highly charged with the emanations from those suffering from scarlatina for 17 days, this man complained of sore throat.

On the 2nd, about noon, he became suddenly insensible, and near midnight was admitted into University College Hospital. At that time there were a few dusky red patches on the skin, the surface was cold, the pupils large, and the pulse scarcely to be felt. The man continued very restless to the last, and at no time after he came under observation could he give any account of himself. An hour or so before death petechiæ appeared on the skin.

He died at 3 a. m. on the 3rd, *i. e.*, less than forty hours after first suffering sore throat.

When the body was examined on the 4th, the whole surface had a purplish, mottled aspect. Small spots of extravasated blood were found in the cutaneous tissue, under the pleuræ, pericardium, endocardium, peritoneum, and gastro-intestinal mucous membrane.

The tonsils were enlarged, and in common with the mucous membrane

of the *velum pendulum palati* and pharynx, highly vascular. The spleen was large, and there was some engorgement of the vessels of the pia mater.

In some of the cases I have examined which proved fatal during the first week, the rash being fully developed, careful examination after death has not enabled me to detect any great change of structure. In some of these cases the general symptoms have inclined to an inflammatory, and in others to a typhoid type. In neither set of cases were the symptoms referable to the specific throat affection very prominent during life. The structural changes of extent or severity that I have found in other cases fatal during the first week, have been—

a Sloughing of the tonsils.

b Ulceration of the pharynx and larynx.

c Intense redness of and granular lymph—the croupose lymph of Rokitansky—on the mucous membrane of the pharynx, larynx, and stomach.

d Abnormal vascularity of the cellular tissue and lymphatic glands in the vicinity of the parotid gland, and of the cellular tissue uniting the lobules of the gland itself, with excess of serosity in the same tissues.

e Blood on the free surface of the arachnoid, without evidence of the rupture of any vessel appreciable by the unaided eye.

The grave structural charges I have found in those cases which have proved fatal after the first week—*i.e.*, after the rash had disappeared, have been—

Sloughing and ulceration of the fauces and pharynx;

Post-pharyngeal abscess;

And which is often termed parotid bubo.

Under this latter term are comprised the following pathologico-anatomical conditions—viz., inflammation and suppuration of the cellular tissue around the gland.

Inflammation and suppuration, chiefly of lymphatic glands over or near to the parotid gland. In either of these cases the purulent fluid may be diffused among the structures, infiltrate them, that is to say; or it may be circumscribed or collected into an abscess.

Inflammation and suppuration of the parotid gland itself. In these cases the pus is diffused through the cellular tissue, dissecting the lobules of the gland from each other.

The remaining serious lesions I have found, after the disappearance of the rash, have been the effects of local inflammation, especially pleurisy and pneumonia, and collections of pus in several parts of the head, trunk, and extremities.

The death, then, in all these cases, can readily be referred to the extreme severity of the general specific disease, to excess of the local specific process, or to the occurrence of complications.

In *scarlatina simplex* and *scarlatina sine eruptione* the specific general disease is moderate in degree, and the specific throat or skin affection trifling in amount or absent. The complete absence of any affection of the fauces must, I think, be very rare, for no instance of it has fallen under my observation. In a tolerably large number of cases, the patient has complained of sore throat: but inspection of the part, in all such

cases, has proved the presence of abnormal redness. In scarlatina anginosa the severe and inflammatory character of the throat affection gives a peculiar aspect to the case. The skin affection may, at the same time, be highly or imperfectly developed.

Under the head of *scarlatina maligna* are included several symptomatologically and pathologically distinct varieties of scarlatina.

1st. That variety in which death takes place a day or two after the first symptoms of disease.

2ndly. That in which the specific local processes of the skin and throat are fully, but not excessively developed, and the patient dies comatose, or sinks suddenly, while the rash is well out, or immediately after it has faded.

3rdly. That in which the eruption is dusky; petechiæ stud the skin; the tongue is dry and brown, the pulse rapid and feeble, and the prostration extreme, and at the same time a tendency is manifested to gangrene of the throat, and also of all parts exposed to pressure.

4thly. That in which, at a very early stage of the disease, acrid discharges escape from the nose, eyes, and ears; the tonsils are greatly increased in size, and, in common with the uvula, *velum pendulum palati*, and pharynx, are red; the parts behind the rami and angles of the lower jaw are considerably swollen; the pulse rapid and feeble; and the rash more or less imperfectly marked.

In this variety, which is so common in strumous children, all the mucous membranes referred to are the seat of ulceration. I have seen, under these circumstances, a patient recover after losing the sight of both eyes from destruction of the cornea, and having the sense of hearing greatly impaired by ulceration of the membranæ tympanorum.

Measles.—A case of measles, in which the disease has assumed a typhoid type; a case of measles, in which death has been caused by the specific disease; a fatal case of measles, in which no local complication existed, has not fallen under my observation.

As in scarlet fever, either of the specific local processes, viz., the skin eruption or the catarrhal symptoms may be absent, or, being present, may vary in severity. But it is chiefly from the presence of complications that marked deviations in particular cases of measles from their type arise, and to cases with such complications, chiefly, that the term "malignant" has been applied.

Typhus Fever.—Cases of typhus fever deviate from the type of the disease chiefly in the greater mildness or severity of the general symptoms, and in the extent and intensity of the specific skin affection. As a rule, the milder the case, the less marked the rash. The danger of the disease is in proportion to the gravity of the general affection, local complications rarely occurring in mild cases to modify the features of the disease. The general symptoms are sometimes so trifling, that the patient hardly needs to keep his bed; while, on the other hand, they are sometimes so severe, that the patient dies within a few hours, constituting the typhus siderans of some authors. The only complication which I have seen causing any material deviation from the type, is inflammation of the intestinal mucous membrane. The symptoms indicating this complication are tympanitic distension of the abdomen, and diarrhœa. After death, there is intense vascular engorgement of the mucous mem-

brane, with a variable quantity of the granular, croupose, or diphtheritic variety of lymph on its surface. In some cases the inflammation is limited to the mucous membrane of the colon; in some cases the inflammation passes the ilio-cœcal valve, and in others is said to be limited to the small intestine; but it never exhibits any tendency to affect Peyer's patches except in common with the mucous membrane of the whole circumference of the intestine. Typhous deposit, as it is called, is never found in typhus fever.

Relapsing Fever.—In relapsing fever the most common deviation from its type is produced by a functional disorder of the liver, which manifests itself by jaundice. I never saw jaundice in typhus or typhoid fevers, though this drawing of the ileum of a soldier, belonging to a native regiment at Sierra Leone, renders it probable that in some countries jaundice does occur in typhoid fever, and also that cases of that disease are confounded, under such circumstances, with yellow fever.

The hue of the skin when jaundice occurs in relapsing fever varies from slight sallowness to intense yellowness. At the same time that the skin is yellow, and bile is present in the urine, the stools contain an abundance of bile, and if death occur the gall-bladder is found full, and the cystic and common ducts pervious. Doubtless, some of the cases known in practice as jaundice from hepatic congestion, are in reality cases of relapsing fever, and a suspicion of this should always cross the mind when a patient is suddenly seized with febrile symptoms and yellowness of the skin, the stools being at the same time dark coloured. In relapsing fever epigastric tenderness is often a prominent symptom. In the second variety of relapsing fever there are lividity and coldness of the surface; a feeble and frequent pulse; delirium of a low type; drowsiness, unconsciousness, and rapid death from asthenia. Jaundice may or may not be present in these cases.

Erysipelas.—There are three great varieties of erysipelas in addition to the typical. I have twice examined fatal cases of erysipelas after death without detecting any marked departure from healthy structure, when during life a little dusky redness about the nose and the most trifling redness of the throat had been the only direct evidence of the disease. The general symptoms were delirium, at first active and then muttering, followed by somnolence and stupor.

The peculiarities in the other two varieties are dependent on the effects of the severity of the inflammation of the skin and subcutaneous tissue in the one case; and on œdema of the loose cellular tissue about the entrance into the larynx, especially that of the arytæno-epiglottidean folds, in the other.

In regard, then, to the deviations from the typical forms of the acute specific diseases, the extreme differences observed in the general aspect of the patient are most commonly due to the severity of the general specific disease in typhus fever and relapsing fever; to the severity and extent of the specific local processes in small-pox and erysipelas; to the presence of local complications in measles; and as often to the severity of the general specific disease as to the extent and severity of the specific local processes and their immediate effects in scarlet fever and typhoid fever.—*Med. Times and Gazette, March* 12, 1853, *p.* 259; *and March* 26, *p.* 311.

5.—*Belladonna as a Prophylactic in Scarlatina.*—[We hear a great deal from the homœopathists of the efficacy of this drug in scarlatina. The following testimony against this efficacy is worth their consideration, and shows the utter fallacy of their reasoning, and the sandy foundation on which they build their views. At a meeting of the Medical Society of London,]

A long and somewhat desultory discussion took place on this subject, having had its origin in a question asked by Mr. White. Mr. Brown had found belladonna to invariably arrest the poison of scarlatina. Mr. Dendy had no doubt that its administration as a prophylactic mitigated the throat symptoms very materially; but Dr. Rogers had abandoned its use after a fair trial, from observing that many persons had the disease after the administration of the medicine. Dr. Radcliffe had used it extensively; but the very worst cases of scarlet fever which had fallen under his notice were those in which belladonna had been given as a prophylactic. Mr. Robarts had tried it in a great number of cases, but had abandoned it, from his complete disappointment in its effects. Dr. R. M. Glover remarked, that the trial of belladonna on a great number of cases, in the hands of some of the most careful observers, had ended in its failure; and Dr. Snow, Mr. Clarke, and Dr. Chowne contended that the negative evidence brought forward in support of the efficacy of the "remedy" weighed as nothing in the balance against the positive facts which had been adduced against it.—*Lancet, Nov.* 27, 1853, *p.* 503.

6.—THE FIBRINOUS CONSTITUENT OF THE BLOOD IN RELATION TO DISEASE.

By B. W. Richardson, Esq.

[In this paper, read before the Medical Society, Mr. Richardson proved "that fibrinous concretions were capable of being formed while the processes of life were going on." Then he asks the question, "Is it an exudation from the inner membrane of the vessel, or is it a direct deposit from the blood?" In reply, he says, those of large size *are* direct and true deposits from the blood. Mr. Richardson further stated, that fibrine existed as *bona fide* fibrine in the blood.]

"The cause of fibrinous deposits during life" now came under view. It was necessary, on entering on this enquiry, to consider what were the agencies which prevented the coagulation of fibrine during life? Several theories had been proposed in reply to this question. The nervous influence had been assigned as the cause of the fluidity of fibrine in the circulating blood by some writers, the vital principle by others, and the solvent power of the blood by a third class. The two first hypotheses were untenable altogether, inasmuch as they were removed from the influence of the reasoning faculties; and the last (a theory) was incorrect in fact. The author had tried the influence of saline solutions on fibrine in the most careful manner, and had found that all saline substances, when perfect in the matter of chemical combination, had no solvent power over fibrine. He believed that the discrepancies which

were to be found amongst writers on this matter had arisen from the circumstance, that different experimentalists had employed salts varying slightly in their chemical nature. The one employing a salt containing a little excess of acid or of alkali, had found fibrine partially soluble in a solution of that salt; whilst another, employing a perfectly neutral salt, had found fibrine insoluble in a solution of it. The author himself was of opinion, that, in normal conditions of the blood, the fibrine was in a mere state of suspension; and that the agents requisite to secure this suspension were a proper amount of motion, a proper degree of temperature, and the continual and rapid development of the three processes,—reproduction, dissolution, and elimination. A combination of simple, and yet striking evidences, added peculiar force to this supposition. Thus, the idea of its suspension in the blood was quite in accordance with the ultimate application of fibrine; being suspended merely, it entered the more readily into the composition of muscle, undergoing, in fact, a mere process of deposition. Suspension, moreover, implied removal from chemical influences and stability in the matter of quantity,—a property which fibrine really possessed. But the most striking proof was the fact, that fibrine in the circulating blood obeyed the same laws as did other dense fluids when mechanically suspended in liquids lighter than themselves. Thus if the motion of the blood was arrested in any part of the vascular system, as by passing through a dilated artery, over a roughened surface, or past an obstructing barrier, the result was retardation of the current, and a deposit of fibrine consequent on the retardation. In normal states, then, fibrine was merely suspended in the blood, and existed there in a certain proportion. But in other states, it underwent various changes; it might be diminished in quantity, or be almost wanting altogether; or, secondly, it might be increased in quantity; so increased that its mechanical suspension was rendered impossible, and then there was nothing for it but that the superfluous portion obey the laws which lead to deposition, and become formed at some favouring point into a fibrinous concretion. But why should increase of fibrine take place? some one might inquire. This question was most important, and in answering it the author would direct the attention of the Society to one or two facts with reference to the formation of fibrine. There could now be no doubt that the presence of oxygen in a certain proportion in the body, and the presence of a moderate degree of temperature, were both necessary to secure the due formation of fibrine. Dr. Gairdner had shown that if an animal were made to breathe pure oxygen for a little time, the fibrine of its blood was increased in amount. He (Mr. Richardson) had carried Dr. Gairdner's experiment further, and had found that if an animal were made to breathe for a great length of time an atmosphere containing an excess of oxygen it sank and died at last, its heart loaded almost to bursting, with fibrinous concretions. [Some fine specimens of fibrinous concretions, which had been taken from the heart of a young cat killed by this process, were at this moment handed to the president]. Thus, then, the mere inhalation of a super-oxidized atmosphere was sufficient to produce an overplus of fibrine. The author was not yet certain whether a condition of atmosphere capable of giving rise to such results ever

existed; the subject required further investigation. There were other circumstances capable of causing the increase in question; 1st. Fibrine might be relatively increased from deficiency of some of the other blood constituents. 2nd. It was evident that if respiration could be rendered too quick, a larger amount of blood than was normal would be exposed to the atmospheric influence, and then would the fibrine be increased. This was, however, rarely a primary condition, and there remained, the speaker opined, a much more common cause for excessive oxidation of the blood in general, and of fibrine in particular. The mention of this idea led him (the author) to introduce incidentally a new theory as to the cause of inflammatory fever and inflammation. It was a law in the animal economy, that all the elements which entered into its composition should pass off from the body by the various eliminatory processes, just in proportion to their introduction into, and distribution through, the body: thus oxygen, carbon, hydrogen, nitrogen, were, in health, ever being eliminated by the skin, by the lungs, by the kidneys, and so on. Now, if from any external physical cause one or other of these eliminatory functions were arrested, the function of the skin say, the results were these:—Either some other eliminating organ performed additional duty until balance was restored, and the system saved, or else the suppressed elements, viz., the grand supporter of combustion, oxygen, and the combustible bodies, hydrogen and carbon, were carried a second time round the system, were reburned, and made to go through a second series of metamorphic changes, thus giving rise, in the first instance, to that heated, excited state of system called inflammatory fever, producing an abnormal increase in the fibrine, the salts, and some other of the blood-constituents, and eventually leading, if a counter-agent were not forthcoming, to the concentration of this super-activity in some favouring structure or organ, and to the process called inflammation—a process which is, in fact, nothing more than the too rapid development in some special organ of the three successive acts, reproduction, dissolution, and elimination.

From these readings of the subject, it would easily be seen, the author thought, how it was that superfibrination of the blood attended inflammatory diseases: why fibrine exuded from serous membranes in some such diseases; and why it was deposited in masses in the circulating system. He was particularly anxious to dwell on the opinion that suppression of one or other of the eliminatory processes gave rise to the results he had described, and he illustrated the question by the analogical observation, that the system, under the circumstances named, was made for the time "to consume its own smoke," an act quite incompatible with health. Mr. Richardson, at this point, proceeded to show the practical nature of the subject he had chosen; he confined his attention to the effects of fibrinous deposits—these deposits might take place in any part of the circulating machinery, and the symptoms they produced varied consequently; forming in the heart, they produce their special effects in at least five different ways. 1st, They may be developed in the course of almost any acute inflammatory complaint. 2nd. They may be developed suddenly, and produce the most alarming symptoms, the patient having shown but few previous indications of acute disease.

3. They may give rise to symptoms peculiar to themselves, throughout long periods of time, no other disease being present. 4th. They may give rise to sudden death, without having previously produced any special symptoms. 5th. They may follow in the course of some exhausting diseases, and in a secondary manner hasten a fatal termination. After the statement of these general rules, a minute description of the various symptoms which fibrinous concretions produce was given, and at the conclusion of the paper a few illustrative pathological specimens were shown, from one of which it was demonstrated that these concretions, when occurring in arteries, are cylindrical like the vessel itself.—*Med. Times and Gazette, Feb.* 12, 1853, *p.* 177.

7.—ON CANCER.

(From a Review of Dr. Lebert's work, by Dr. W. H. Walshe.)

[The peculiar milky juice of cancer is insisted upon by Dr. Lebert as an unfailing test of the presence of cancer by the naked eye. Dr. Walshe, however, remarks, that though *almost* an unfailing proof, still it may, in some cases, prove deceptive. Dr. Lebert also observes, that the cancerous or non-cancerous nature of a morbid tissue may be determined by microscopical examination, though he is not so positive about any single isolated cell. He says,]

The type of the cancer-cell is a "small regular sphere, with an elliptical nucleus, placed excentrically, filling nearly the half, or upwards, of the interior of the cell, and containing one or more large nucleoli." But this typical form is often not maintained with purity; the cell-wall assumes an ovoid, elongated, or triangular shape, with acute or obtuse angles. According to M. Lebert, it may even be of true "fusiform" outline—a shape we have never seen; all varieties of "shapelessly caudate" form, we agree with him in recognising as of occasional, even tolerably frequent, occurrence. To this multiplicity of contour much importance, and with good reason, is attached by the author; and he fairly urges that if similar diversity may be found, on superficial examination, in epidermic tumours, it can always with ease be traced, either to folding or some morbid change of the epidermic cell.

[Dr. Lebert subsequently acknowledges that the most baneful cancer may run its course through the system without exhibiting its (said to be) characteristic cells; thus confirming the observation made by Dr. Walshe some years ago, to the effect that]

A tumour may present to the naked eye the characters of encephaloid, be the seat of interstitial hemorrhage, affect the communicating lymphatic glands, run in all respects the course of cancer, and nevertheless contain no cells but such as are undistinguishable, in the present state of knowledge, from common exudation-cells.

M. Lebert very justly raises his voice against the doctrine of the "degeneration" of non-cancerous tumours into cancers. The notion, indeed, one of the most flagrant heresies in pathology, could not survive an hour,

did it not furnish so convenient a loophole of escape from errors in diagnosis. A given tumour is pronounced by experienced persons, at an early stage of its growth, to be non-cancerous. It enlarges, and is cut out. The qualities of cancer are recognised. But no error, it is held, has been committed; the tumour was, in truth, of innocent nature at first; it subsequently "degenerated." Now, in point of fact, degeneration by conversion is an impossibility, and the only way in which the change from non cancerous to cancerous character could be effected, is by the *de novo* development of cancer within the area, and from the vessels, of a non-cancerous formation. Experience proves, that while there is no *à priori* impossibility of its occurrence, such development is infinitely rare; for our own parts, years ago we wrote that we had searched in vain for an example of it in fibrous tumours, its alleged most common seat, nor have we succeeded since. M. Lebert states that he has twice known cancer form in tumours, primarily non-cancerous, but does not mention their nature. It must, then, be admitted, that in excessively rare cases a change simulating "degeneration" to the merely practical eye, does actually occur; but this is a very different thing from real degeneration, being a common phasis of evolution of non-cancerous growths.

Authors in general admit that cancer destroys life in various ways. The writer of the present volume professes a different doctrine. He has met with such a number of cases of deaths from the progress of a *single* cancer (unattended with secondary formations) "in which there was neither abundant suppuration, nor repeated hemorrhages, nor serious functional disturbances, to cause death," that he has "come to the conviction that cancer kills, after a certain duration, by *general death of the system*, and not by a purely local affection—by *infection of the entire economy*, and not by incidental disturbance of an important organ. Cancer kills by depriving the blood of the power of sustaining life, not by causing loss of blood either unchanged or altered through exudation." That the condition of blood existing in cancer is capable of killing seems certain; but M. Lebert's notions would lead us to attach too little importance to all morbid conditions beyond that fluid. Still, he argues his case pertinently:

"The reaction produced by secondary cancer, even when this is serious in character, is often so little apparent, that frequently, no matter what attention has been paid to the case clinically, during life, secondary formations are found in organs where no one expected their existence. Again, compare the bodies of two individuals, both cut off by a cancerous growth, which ran its natural course without disturbance, but the one presenting a single cancerous tumour only, the other numerous secondary formations, and you will certainly not find a great difference in the two bodies in respect of amount of discoloration, emaciation, atrophy of the tissues, and impoverishment of the blood."

The importance of this doctrine in regard of treatment would be extreme, could M. Lebert afford us the material demonstration of the blood-alteration which he regards as so all-efficient. Here, however, he fails, as all who have gone before him. But who has proved alteration of blood, impregnated with syphilitic virus? And yet who doubts its existence? The day will come, however, and in all probability before

long, when actual microscopical and chemical demonstration of the incipient alterations of the blood in diathetic diseases, as a class, will be obtainable, and so a material basis formed for the now prevalent conviction that there is a condition of the fluids capable of being therapeutically handled, which precedes local manifestations of the disease in each diathetic affection.*

[Cancerous diseases are not to be cured by medicine. Upon this point M. Lebert is positive enough, and condemns all reputed cures thus produced as erroneous. At the same time, however, he acknowledges that the day may come when we may antagonize cancerous poison as we do that of intermittent fever by bark, or constitutional syphilis by mercury.] —*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 92.

8.—*On the Treatment of Cancer.*—M. Devay (Gaz. Méd., 1852, No. 52,) of the Hôtel Dieu Lyon, has long been engaged in investigating the therapeutical properties of conium in cancer, being of opinion that Storck's experiments should be resumed with the aid of the improved chemical knowledge of the present period. He finds the best preparations to be an extract and balsam, containing 1 per cent. of conicine, made from the seeds of the plant, gathered when at maturity, of full weight, and of an ash-grey colour. As the result of his researches he states,—1. That an ointment, applied externally, in chronic enlargements of scrofulous glands, possesses a resolvent power greater than that of any other substance. 2. In engorgements of the uterus, or inflammatory hypertrophy of the organ—so frequently complicating its prolapsus or deviation—this medicine, employed internally and externally, is of great service. 3. In cancerous affections it exerts remarkable calming effects, and in some cases even cures seem to have resulted from its employment, especially in the atrophied form of scirrhus. Its use is less satisfactory in soft and rapidly increasing tumours, but the progress of some of these has seemed to be retarded. In other cases, it has diminished the size of secondary tumours, rendering the primary ones more amenable to surgical operation. As a means of assuaging suffering, whether used topically or taken internally, it is invariably preferred by the patients to opium and all other narcotics.

M. Manec, surgeon to the Salpêtrière, has just obtained a recompense of 2000 francs from the Académie des Sciences (Gaz. Méd., 1853, No. 10,) for the perseverance he has shown in investigating the action of Frère Côme's Arsenical Paste in more than 150 cases of cancer, in some

* In cases of Bright's disease, which we hold to be indubitably a blood-disease *ab initio*, the failure of treatment probably comes essentially of the existing inability to diagnosticate the affection, before its *local anatomical character in the kidney* has been developed. This anatomical character now absorbs attention; and to it, treatment is directed almost alone. It would be just as rational to aim at the cure of phthisis, small-pox, typhoid fever, or scurvy, by local applications to the pulmonary tubercles, the cutaneous pustules, the intestinal deposit with its ulcerative effects, or the cutaneous blotches and spongy gums, which severally constitute anatomical characters of those affections.

of which he obtained unhoped-for results. His experience leads him to these conclusions:—1. That the arsenical paste penetrates the cancerous tissue by a sort of special action which is limited to it. This action is not simply escharotic, for beneath the superficial, blackish layer, which the caustic has immediately disorganized, the subjacent morbid tissue seems struck with death, though it may retain its proper texture, and almost its ordinary appearance. Later, the cancerous mass is separated by the eliminatory inflammation which is set up around its limits. The same paste, which extends its action more than six centimetres deep in a cancer of close texture, when applied to superficial gnawing ulcers, usually only destroys the morbid texture, however superficial this may be, and respects the sound parts. 2. The absorption of arsenic is proportionate to the extent of surface to which it is applied; and as long as this does not exceed a two-franc piece in size, there is no danger from this source. A large surface should only be attacked by successive applications. 3. Arsenic which is absorbed is chiefly eliminated by the kidneys, during a space of time of not less than five, and not more than eight days, as amply demonstrated by Pelouze. Thus, if we allow nine or ten days to intervene between successive applications, all danger from absorption may be avoided.

M. Gozzi (Bull. delle Sc. Med., xx. p. 231) strongly recommends the following caustic for the destruction of cancerous growths:—Corrosive subl., ℈j; caustic potass, ʒss; arsenic and cerussa, āā, gr. vj.—to be made into a paste with starch and white of egg. While using this or other caustics, emollient poultices, ointments, &c., should be avoided, as diminishing their effects, unless the irritation produced by their application has been excessive. M. Gozzi objects to the usual plan of destroying the tumour, layer by layer, from the apex to the base, the latter becoming very indurated after these repeated applications, and offers great obstacles to the approximation of surrounding granulations and their cicatrization. He prefers applying the caustic laterally, in the direction where the tumour seems most inclined to separate.

M. E. Cazenave (L'Union Médicale, ix.) speaks very highly of a caustic formed by pouring hydrated sulphuric acid on powdered saffron. —*Brit. and For. Medico-Chirurgical Review, April,* 1853, *p.* 570.

9.—ON RHEUMATISM.

(From a Review of the work on this subject by Dr. Henry William Fuller, Assistant Physician to St. George's Hospital.)

By Dr. W. Senhouse Kirkes.

[In commencing the consideration of the subject, Dr. Fuller ascribes the real predisposing cause of rheumatic fever to some morbid condition of the blood, and believes that mere exposure to cold and damp is not sufficient to produce the disease. He says,]

If certain substances are introduced into the circulation, fever is set up, rigors often occur, and inflammatory symptoms very shortly supervene in various parts of the body: symptoms which vary in intensity and

locality, according to the amount and character of the poison. And if the blood be altered in character, it is practically the same, whether it contain matters foreign to the system, and altogether morbid in kind, or whether it contain an excess only of some material, a certain amount of which is compatible with health. In either case it is unhealthy and poisonous in its nature: in either case it contains a *materies morbi*, which may not only produce fever, or the symptoms of general derangement, but if irritating in its nature, may give rise to local inflammatory symptoms.

[Like Dr. Prout, Dr. Todd, and others, Dr. Fuller believes that lactic acid being retained in the blood instead of being eliminated by the skin, is the special materies morbi of the disease. Whether this be so or not, all agree in believing that it is generated within the system, and not absorbed from without. The development is called into play by any long continued depressing influence upon the system. When the system is thus deranged, and the]

Rheumatic poison is present in it, any disturbing circumstance, even of temporary duration, such as over-fatigue, anxiety, grief, or anger, by rendering the system more susceptible of its influence, may prove the accidental or exciting cause of the disease, and exposure to cold or to atmospheric vicissitudes is almost certain to induce an attack.

[Dr. Fuller considers that although the fibrous and fibro-serous textures are those which chiefly suffer, still from its being a blood disease, all parts of the body must be more or less liable to be affected. He then proceeds to discuss *the treatment* of rheumatism. Speaking of the different methods of treating the disease, he says,—]

But as, when uncomplicated by cardiac affection, the disease usually terminates sooner or later in recovery, and sometimes subsides with marvellous rapidity under every variety of remedy, it is obvious, that no sound inference can be drawn as to the success of any particular method of treatment, unless such treatment has been largely adopted. and has been attended with tolerably uniform results. And I am sure I may say, without fear of contradiction, that each and every plan of treatment which has been hitherto proposed is regarded by the profession as unsatisfactory. If in one person's hands any particular remedial course has proved efficient, it has signally failed in those of another: if at one time a remedy has proved efficacious, it has been found inert or injurious at another, under different circumstances of age, sex, constitution, and the like. Nor does this appear strange to those who consider the true nature of the disorder, and the variety of circumstances under which the physician may be called upon to minister to his patient's relief. The bleeding, which in the young, plethoric, and robust, may be necessary to allay excessive vascular action and cause free secretion, may, in the weakly, induce irritability of the heart, and a consequent attack of cardiac inflammation. The opium, which in one person may prove of the greatest service in promoting free perspiration, and in allaying the general irritability of the system, may, in another, check the biliary and other secretions, and thus prevent the elimination of the

rheumatic poison. The continued use of calomel, and the constant purging, which may be beneficial to one patient, by removing large quantities of unhealthy secretions, may unnecessarily exhaust the strength of another, and tend very greatly to impede recovery. And so in regard to every remedy which has been proposed: what is useful at one time, proves useless or positively injurious at another.

Of the value of alkalies and their salts generally, Dr. Fuller speaks in the warmest terms. To this favourable opinion of the value of alkaline remedies, the profession generally is beginning to yield assent, especially as the opinion gains ground, that rheumatism is dependent on a morbid, probably acidulous state of the blood; and that, in consequence, there is a preternatural tendency to the deposition of fibrine, which is counteracted by the free introduction of alkalies, by means of which the solubility of the fibrine is increased.

The general plan of treatment which Dr. Fuller advocates does not materially differ from that commonly practised, consisting principally of the free use of alkalies, combined with colchicum, calomel, and opium. Besides these internal measures, however, he employs, apparently with very marked advantage, the application of warm alkaline and opiate fomentations to alleviate the pain of articular inflammation. The solution he commonly uses for this purpose is composed of an ounce of carbonate of potash dissolved in a pint either of decoction of poppies, or of rose-water to which six drachms of Battley's solution is added; and he speaks most highly of its efficacy. "In every instance in which it has been employed, the relief obtained has been almost immediate, and the pain and inflammation have subsided rapidly.

[In considering the subject of rheumatic affection of the heart, Dr. Fuller expresses his disbelief in its arising from any metastasis from the joints. He considers it another mode of the manifestation of the blood disease, and an indication of an unusually severe form of the disease. In noticing the mode of the origin of the fibrinous concretions or warty vegetations upon the valves of the heart, he remarks:]

Until recently, these warty growths have been almost universally ascribed to inflammatory exudation from the tissue of the affected valve; but latterly the opinion has been gaining ground, that they consist principally, if not exclusively, of fibrine deposited directly from the blood. This view, which is strongly maintained by Dr. Fuller, was brought very prominently before the profession, in 1850, by Mr. Simon, in his very excellent series of lectures on general pathology. Among the reasons which Mr. Simon there offers in support of this view are, first, the improbability of the lining membrane of the circulating apparatus becoming inflamed at all, since it contains no blood-vessels, and probably derives its nutriment from the stream of blood directly in contact with its inner surface. Yet, as observed by Dr. Ormerod, "this objection is more specious than real; for inflammation may be carried on by the same organic means as nutrition. And if, in any part, nutrition by unusual means effect an ordinary end, surely inflammation in the same part may do so likewise." And it may be further urged, that even although the opinion, that the lining membrane of the circulating system depends,

both for its ordinary nutrition and its morbid changes, on the blood in contact with its interior, and not on that in the vasa vasorum, be admitted to apply to the membrane lining the blood-vessels and general cavities of the heart, which seldom present evidences of disease, it can scarcely be supposed to hold good in the case of the valves; for both artificial injection and the vascularity induced by disease equally demonstrate the existence of a very free interstitial supply of blood to the textures both of the semilunar and auriculo-ventricular valves. And since it is on these parts that fibrinous deposits almost exclusively occur, and on which various unmistakeable evidences of inflammatory action, such as general vascularity, swelling, and occasionally ulceration, are observed, we should be cautious ere we entirely discard the opinion that fibrinous vegetations are, to some extent at least, dependent on inflammatory exudation, though probably increased by subsequent deposition from the blood. Against this inflammatory origin of these vegetations, there are, however, other very important objections, which Mr. Simon, in common with others, strongly urges: for example, the far greater frequency with which the left valves in comparison with the right are affected, and the very striking and almost constant fact, that the fibrinous deposits are observed only on that side of the valve in contact with the moving blood. If inflammation were the cause of the warty growths, the right valves might naturally be expected to be as much affected as the left, since both are supplied by the coronary arteries; and both sides of an affected valve should present the exudations in equal amount, or if there was any difference, the side next the moving blood ought perhaps to show a smaller amount, owing to the liability of the stream to wash the deposit from the surface as rapidly as it is formed. By referring the fibrinous growths to direct deposition from the blood, both of these facts are explained; the left valves being in contact with arterial and more highly fibrinized blood than the right, are more likely to become coated over with fibrine, while the surface directly opposed to the sanguineous stream is more likely to receive the deposit than the opposite one. The greater tendency of arterial than of venous blood to deposit fibrine when in motion, was repeatedly made the subject of direct experiment by Mr. Simon, who passed a thread through a main artery and contiguous main vein, leaving it for some hours to cut the stream: on removal, the portion of thread in the artery was invariably found coated with warty vegetations of fibrine similar to those on the valves of the heart, while that in the vein was never thus affected.

Against this weight of evidence in favour of the opinion that the vegetations so frequently found on the valves of the heart in connexion with articular rheumatism are the result rather of direct deposition of fibrine from the blood than of inflammatory exudation from the tissue of the valve must, however, be still opposed the fact already mentioned, that certain changes are sometimes observed, which can only be ascribed to an inflammatory process; as, for example, the soft, swollen, and vascular state of the tissue of the valve, but most especially to occasional ulceration. And since each of these, though sometimes observed to be unaccompanied by attendant fibrinous growths, are yet often found combined with them, the safest and perhaps the most correct view we ought at

present to take of the vegetations in question is, that they may, in some cases at least, have a double source, being partly and primarily derived from inflammatory exudation, and subsequently enlarged by the deposition of fresh particles of fibrine from the blood flowing over the thus roughened surface, the tendency to such deposition being at the same time highly increased in consequence of the blood being unduly charged with fibrine, and, perhaps from the existence of some acid within it, less able than usual to retain the fibrine in solution. Whether the opinion be correct, that in some, and if so, in what proportion, of the cases, the fibrinous vegetations on the valves result exclusively from direct deposition of the fibrine of the blood, independently of any previous disease of the tissue of the valve, are questions which we are scarcely yet in a position to pronounce upon with certainty. Whatever view, however, he really held concerning the origin of the growths in question, there can be no doubt of the propriety of employing in the treatment of rheumatism those remedies which, such as the alkalies and neutral salts, especially those of potash, seem to possess the property of preventing the deposition of fibrine from the blood by increasing its solubility, and thus perhaps guard against any great increase of the vegetations, however they may have been formed in the first instance. Dr. Fuller briefly alludes to the possibility of the fibrinous deposits being occasionally detached from the valves; but he does not enter into the details which the admission of such a possibility almost necessarily entails. As this subject has been fully discussed by the writer of the present article, in the last volume of the "Medico-Chirurgical Transactions," it seems unnecessary to dwell upon it here.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 150.

10.—ON THE PATHOLOGY OF RHEUMATISM AND GOUT.

By Professor Bennett, Edinburgh.

The present theory with regard to these affections is, that they are both connected with an increase of lithic acid in the blood. In rheumatism, this is dependent on excess of the secondary, and in gout on excess of the primary, digestion. In rheumatism, however, there is considerable excretion of lactic acid by the skin (Todd), whilst in gout there is an excess of soda, which, uniting with the lithic acid, produces a compound of lithate of soda, that may be detected as such in the blood (Garrod), while sometimes it exudes into the cellular tissue of the skin, constituting tophaceous deposits. In both diseases there is an undue balance between the excess of lithic acid and the power of excretion,—in rheumatism by the skin, and in gout by the kidney. This pathology serves to explain the similitudes and differences existing between the two affections. In both there is a certain constitutional state, dependent on deranged digestion, during which exciting causes occasion local effects. These exciting causes in rheumatism are bad diet, hard work, exposure to cold and wet, and its subjects generally are the poor and labouring population. In gout the causes are good diet, indolence, repletion, or or indigestion, and its subjects are for the most part the rich and seden-

tary. The local manifestations in both are acute wandering pains, with pain and swelling—in rheumatism of the large, and in gout of the small joints, constituting the acute attack in the one, and the so-called regular attack in the other. These are combined with a tendency to various complications of the internal viscera, which are more or less dangerous to life.

The general indications of treatment are, in both diseases, (1st) so to regulate the nutritive functions as to ensure a due balance between the amount of matters entering the blood as the result of digestion, primary or secondary, and the amount of matters discharged from the economy by the excretory organs. (2d.) To conduct the acute attack to a favourable termination, carefully watching the internal viscera, and being prepared to act with vigour should these become affected. Hence the treatment of these diseases resolves itself into what may be called curative and preventive,—the first having reference to the acute attack, the second to the means most likely to hinder its return; the one must be carried out by remedies which act upon the blood and excretory organs, the other by the management of diet and exercise.

Treatment of Acute Rheumatism by Nitrate of Potash.—Although the general pathology above-mentioned, which considers rheumatism as a blood disease, may be considered on the whole as correct, we are not yet enabled to explain by it the symptoms of an acute attack of the disease, where, in addition to the constitutional disorder, we have local pain, occasional heat, redness and swelling, with febrile symptoms. Most practical men have attributed these phenomena to a superinduced inflammation, although it has not been shown that exudation occurs, or that it is followed by the usual results of that condition. Besides, its erratic character is opposed to what we know of the process of true inflammation, and calling it an unhealthy inflammation in no way clears up the mystery. The real pathology of acute rheumatism, therefore, has yet to be determined, and, as a preliminary step, a careful histological examination of the affected tissues is absolutely necessary. So far as I am aware, this has never yet been attempted, if we except some observations by Hasse on the structure of the bones in rheumatism (see the Monthly Journal for June, 1847.)

Our treatment of this disease, therefore, is purely empirical, sometimes directed against the pain, at others against the supposed inflammation; now attempting to combat the pathological condition of the blood, then striving to remedy its effects by acting on the excretions, and not unfrequently giving specifics, in the hope that any change in the constitution, however produced, may be beneficial. In no disorder, probably, has such a crowd of opposite remedies and plans of treatment been extolled, and yet none of them can be depended on, so that it has been imagined that six weeks' rest is the most useful prescription (Warren.) The latest author on Rheumatism endeavours to explain this by observing, that this need not be wondered at by "those who consider the true nature of the disorder, and the variety of circumstances under which the physician may be called upon to minister to his patient's relief. The bleeding, which in the young, plethoric, and robust, may be necessary to allay excessive vascular action and cause free secretion, may

in the weakly induce irritability of the heart, and a consequent attack of cardiac inflammation. The opium which in one person may prove of the greatest service in promoting free perspiration, and in allaying the general irritability of the system, may in another check the biliary and other secretions, and thus prevent the elimination of the rheumatic poison. The continued use of calomel, and the constant purging, which may be beneficial to one patient by removing large quantities of unhealthy secretions, may unnecessarily exhaust the strength of another, and tend very greatly to impede recovery. And so in regard to every remedy which has been proposed. What is useful at one time proves useless, or positively injurious, at another; and the conclusion is forced upon us, that what is wanted 'is far less the discovery of untried methods of treating disease than of discriminative canons for the proper use of those we possess';—far less the discovery of any new medicines, than the adaptation of our present remedies to the exigencies of each case." (Fuller on Rheumatism, p. 73.) These judicious observations may serve to explain the cause of our failure; but until we obtain more exact information regarding the *special* pathology of rheumatism, it is in vain to hope for a rational treatment.

For my own part, I generally treat rheumatism on what is called "general principles"; these are, to alleviate severe pain by anodynes, diminish excessive vascular action by moderate bleeding and saline antiphlogistics, and encourage every attempt at critical discharges by diaphoretics, diuretics, purgatives, &c. Occasionally I have tried the effects of special remedies in this disease, and watched a series of cases, all of which were treated in the same manner. Thus I have tried aconite, and believe that alone it is of little service; colchicum also I have given frequently, and am of opinion that in pure rheumatism it is of no advantage, although in gout it is invaluable. This session (1851-2) you have witnessed another trial of this kind with the nitrate of potash, a remedy formerly recommended by Dr. Brocklesby, and which has been given with good effect by M. Gendrin, in the wards of La Pitié, in Paris, as recorded by Dr. Henry Bennet (Lancet, 1844, vol. i., p. 374.) It has more lately been pressed on our attention by Dr. Basham (Medico-Chir. Trans., vol. xxxii.,) who tells us that from one to three ounces of the salt, if freely diluted in water, may be taken by the patient in the course of twenty-four hours, without any injurious results, but with the effect of relieving in a marked manner the swelling, heat, and pain in the joints.—*Monthly Journal of Med. Science, Dec.* 1852, *p.* 566.

11.—*Cases of Rheumatism treated by Lemon-Juice.* From the Clinical Reports of Professor Bennett.—*Case* 1.—Abigail Rankin, a servant, æt. 39, admitted 15th December, 1852. Had rigors on the 7th, followed by febrile symptoms and acute pain in all the joints. On admission, pulse 100, full and strong; heart sounds normal; considerable febrile symptoms; acute pains and swelling in all the joints increased on motion; much sweating at night. Other functions healthy. Habeat succ. limonis, ℥ij. ter in die. On the 17th, she was ordered ℈j. of

Dover's powder. December 20th. The pains have continued as acute as ever till to-day, though she has taken ℥vj. of lemon-juice daily. At present she can move the joints slightly without so much suffering. Habeat ℥iij. succ. limonis, ter in die. December 22nd. There was great sweating last night, and to-day is much better. Habeat ℥j. succ. limonis ter in die. Some swelling of the left wrist joint remained until the 23rd, on which day all pain had left her. Dismissed well January 6th, 1853.

Case 2.—Catherine Rooke, æt. 21, married, admitted December 23rd, 1852. Had rigors on the 14th, followed by febrile symptoms, and excessive pain, at first, in the knees and ankles, but subsequently in every joint of the body. On admission, pulse 84, of moderate strength; heart's sounds and impulse normal; the joints are more or less swollen, painful on pressure and on motion; skin bathed with perspiration; febrile symptoms with the exception of increased pulse well marked; a considerable deposit of lithates in the urine. Other symptoms normal. ℞. Pulv. Dover, gr. x. statim sumend. ℞. Sol. mur. morph. ʒss.: potassæ bitart. ʒss.; sp. æther nit. ʒj.; aquæ, ℥j. Ft. haust. hora somni sumendus. On the 25th, purgatives of calomel and jalap were ordered. December 26th. The pain and swelling of the joints have somewhat diminished, but are still very acute. Habeat succ. limon. ℥j. ter in die. January 2, 1853. The pains have slowly subsided since last report, but there is still considerable soreness and stiffness of the knees. The arthritic swellings have everywhere disappeared. January 4th. Acute pain has returned in the right arm, which she cannot move. January 5th. Acute pain has extended to the right arm and back. Omittantur succ. limonis. ℞. Potassæ nitratis ℥ss.; aquæ ℥jv.; M. sumat ℥j. ex aquæ, ℥iv. ter in die. January 6th. Pains now disappeared; marked improvement. No critical discharge. Dismissed well January 7th.

Case 3.—Thomas Aitken, æt. 30, blacksmith, admitted December 25th, 1852. Fourteen days ago, after exposure to cold, was attacked by rigors, followed by febrile symptoms and pain in his joints, which have continued up to this date. On admission, pulse 74, rather weak. A blowing murmur, with the faint sound loudest at the apex, which, it seems, resulted from a previous attack twelve months ago. Slight swelling only in his right hand and wrist, but there is pain in all the joints, more or less, of an erratic character. Febrile symptoms very slight. Slight bronchitis. Habeat succ. limonis, ℥ss. ter in die. On the 28th, the dose of lemon-juice was increased to ℥j. On January 2d, he was much better; but on the 4th the pains returned, but not so violently. On the 12th, he was free from pain, having had some diarrhœa, and taken two ℈j. doses of Dover's powder. On the 22d, the pains returned, but again subsiding on the 24th, he was dismissed.

Case 4.—James Ollason, æt. 20, clerk, admitted January 4th, 1853, with organic disease of the heart of old standing, and chronic rheumatism of an erratic character, sometimes violently attacking one joint and sometimes another, accompanied with swelling and tenderness. Lemon-juice in ℥j. doses was tried three times a day, for four days; but being evidently of little benefit, was then abandoned for opiates and sedatives.

Commentary.—In no one of these four cases in which lemon-juice was given, although in two six ounces, and in one nine ounces were taken daily, did it appear to me that the disease was in any way controlled or alleviated by the remedy. In Case 1, six ounces were taken daily without any effects, and then the quantity was increased to nine ounces daily, until the 21st day of the disease, when sweating and resolution of the symptoms followed, more from natural crisis, perhaps, than from the effects of the juice. In Case 2, the remedy was continued for two days, and until the 21st day of the disorder was fairly passed. Then nitrate of potash was given with the immediate effects of relieving the symptoms —although here also it is not improbable that a natural crisis of the disease was then established. In any case the inefficacy of the lemon-juice appeared manifest. Cases 3 and 4 were cases of sub-acute and erratic rheumatism, which also resisted the lemon-juice; the first for a month, the second for four days. On the whole, this trial of the remedy was in no way favourable, and is strongly contrasted with the good effects of nitrate of potash, which I formerly brought forward.—*Monthly Jour. of Med. Science, April* 1853, *p.* 352.

12.—*Infusion of the Leaves of the Ash-tree (Fraxinus polygamie) in the Treatment of Gout and Rheumatism.* By Drs. Pouget and Peyraud.—The most useful acquisitions in materia medica are due generally to chance, or, rather, to a protective Providence over human health; *e. g.*, the antiperiodic properties of cinchona.

In 1842, Dr. Peyraud experienced his first attack of gout, for which he employed the usual remedies. The attack lasted twenty-five days. During the three following years the disease increased both in frequency and violence, and the patient went through the several forms of treatment without finding relief. He heard by accident that the infusion of the ash-leaves had long been considered a specific in the department of Dordogne, and that the peasantry of the district used it to "chase away their pains." Dr. Peyraud found it upon trial so useful that he had but one attack of gout from 1845 to 1849.

M. B., a merchant of Bordeaux, was seized with an attack of gout, for the first time, in the right foot. He was ordered infusion of ash-leaves; upon the second day he was able to come down stairs and to leave his house. Ever since he has had recourse to the same remedy with good effect upon experiencing premonitory symptoms, such as headache, loss of appetite, &c. The same success followed its administration in cases of acute articular rheumatism. A house-painter, aged 28, had upon several occasions, suffered from acute articular rheumatism, accompanied by endocarditis, which prevented his following his occupation for four months or more. December 25, 1849, he had pain in the articulations of the feet, knees, and wrists, with swelling, accompanied by difficulty of respiration and inability to lie down. December 30, he was so weak, that it was thought better before bleeding him, to try the infusion of ash-leaves. In about twelve hours, and after the third dose, the patient was able to breathe easier, and there were fewer præcordial

pains. On the fourth day, the articular pains had diminished in intensity, the respiration was freer, and the appetite had returned. Jan. 22. He was able to resume work. The authors now administer it in the form of a fine powder in preference to the infusion. Other cases are related in the Essay.—*L'Union Medicale, Nov.* 1852; *Med. Times and Gazette, Dec.* 25, 1852, *p.* 650.

13.—*On the Employment of Fomentations of Digitalis in the Treatment of Certain Forms of Ascites.* By Dr. Raymond Falot.—The internal use of digitalis in powder is not always free from inconvenience; a local action more or less irritant, abundant alvine evacuations, accompanied with colic, can contra-indicate it in the treatment of certain serous effusions, especially in the intermediate form between simple exhalation of serosity and subacute peritoneal inflammation. According to M. Andral, the decoction of digitalis, applied as a fomentation, is a powerful diuretic, which can be substituted for the internal administration whenever the patient is suffering from gastro-intestinal irritation, a common complication with ascites. Bayle, Trousseau, and Pidoux recommend also the topical use of the remedy.

Justine B., aged 18, who had menstruated since 13, and enjoyed good health till 18, when she was attacked with necrosis of a superficial part of the lower jaw, caught cold from being exposed to wet in the country. The day following, she suffered from a severe attack of erysipelas of the face. Subsequently there ensued amenorrhœa, progressive emaciation, swelling of the abdomen, and diminished urinary secretion. The abdomen measured thirty-seven inches round the umbilicus; there was evident fluctuation. Heart's sounds natural. The operation of paracentesis was successfully performed, and she recovered so as to pursue her usual avocations.

She again exposed herself to cold and wet, when a second attack of ascites came on, and the urine was albuminous. Fomentations of digitalis, combined with moderate pressure, removed the effusion into the peritoneum in about one month. She is now recovered, except that she experiences a slight dragging feeling in the abdomen, if she does not incline the trunk forwards in walking.—*Med. Times and Gazette, March* 12, 1853, *p.* 277.

DISEASES OF THE NERVOUS SYSTEM.

14.—ON SOME OF THE DIFFERENT FORMS OF LOCAL HYSTERIA RESEMBLING NEURALGIA.

By Dr. Robert B. Todd, F.R.S., &c.

[Dr. Todd presents us with the two following interesting cases of this disease. The first occurred in a woman named Harriet B., aged 30, admitted May 7, 1851. For the notes of this case we are indebted to Mr. T. Bridgewater.]

The point of greatest interest about the case is, that she suffered acute pain in the right hypogastric region of the abdomen; the pain was of so acute a nature that she could not bear the slightest pressure on the affected part; even the weight of the bed clothes was painful to her. This pain was her main complaint, and it was for the relief of this she has been admitted to the hospital. It would be impossible to find an instance of a more strictly localised pain than that afforded by this case, nor could I bring before you a more striking example in which relief from pain was more peremptorily demanded from the physician as the one thing complained of by the patient. Cases of this kind you will often meet with hereafter in your practice, and you will do well to note carefully such as may come before you now, and the treatment which may appear to be serviceable, for nothing contributes to professional success more than the power of readily appreciating the nature and causes of pain, and tact in applying suitable and efficacious remedies.

Severe abdominal pain, whether general or limited to a spot, is at once suggestive, both to practitioner and patient, of inflammation within the abdomen; it may be, of peritonitis. This latter malady is, as you know, a severe one, and, in the majority of cases, fatal. How important, then, is it to be able to determine whether such pain is due to a cause of this kind or to some other!

The pain under which this woman suffers is referred to the right hypogastric region, over the position of the right ovary, and the painful part occupies a circular space of about two and a half or three inches in diameter. There is extreme tenderness to the touch; even when the integuments are pinched up with the utmost gentleness, and with every care to avoid compression of the subjacent parts, she shrinks and appears to suffer great pain. Deep pressure on the corresponding region of the left side causes pain likewise, as if by implicating the right side.

There is another very important feature in the case which deserves especial notice; it is this, that when her attention is much engaged, she certainly suffers less, although she cannot be said to be free from pain. Upon making a careful examination of the part, we could detect no tumour; and, upon pressing deeply, no abnormal condition of the ovary could be discovered; and although there was pain, there was no increase of it to a proportionate extent.

[It is to be observed in this case that the pain was nearly as great under slight as under deep and heavy pressure. Such a pain might arise from irritation in the neighbourhood of the commencement of the colon, from peritonitis, from inflammation of the ovary, or from any inflammation of the abdominal muscles; but opposite reasons were too powerful to allow of such being the case.]

Lastly, the symptoms might be referrible to that peculiar state of the nerves, superficial as well as deep, which gives rise to that kind of pain which conventionally, (and, in the present state of our knowledge, conveniently enough) we call "hysterical pain." This pain, also called a nervous pain, is no doubt just as acute and severe to the patient's feelings as any pain from injury or organic lesion, although, in the parts to which it is seated, we can discover no alteration of structure whatever.

You see that we have excluded from the diagnosis peritonitis, enteritis, and inflammation of the ovary. Let us now inquire how far the hypothesis of the pain being hysterical is borne out by the accompanying phenomena.

The great tenderness of the skin to the slightest touch is very favourable to this view, which is likewise supported by the fact of the little difference in the intensity of the pain under deep and under superficial pressure.

The slightest touch to any other part of the body makes the patient suddenly shrink back with a greater or less expression of pain,—a character which belongs to all these hysterical affections. Often when you bring the finger close to the skin, there is an expression of pain nearly as great as if you had actually touched it.

Certain features in the general constitution of the patient confirm this view; she is evidently of an hysterical constitution, and exhibits that peculiar appearance of countenance which I have often pointed out to you by the name of "facies hysterica," characterised by a remarkable depth and prominent fulness, with more or less thickness of the upper lip. There is also a fulness and obviously drooping condition of the upper eyelids. This drooping conformation of eyelids is at once a mark of beauty, and of that from which many beautiful women suffer very much, namely, the hysterical state of constitution.

She also exhibits that irritable state of spine under which hysterical patients are apt to suffer. The least pressure on a spinous process causes her to shrink, and to complain of a pain shooting forwards from the point pressed on; and, as is so often the case with patients of this temperament, she complains of pain from pressure, in whatever part of the body it may be applied; whenever she is touched, whether the finger comes in contact with her arms, or back, or any other part of the body, she exhibits an undue degree of sensibility, and shrinks.

Then there is yet another point about the case which I have not mentioned. We find, on referring to the history, that the patient never menstruated regularly. In the vast majority of cases of hysterical affections you will find something wrong about the uterine functions; and although I am not prepared to lay it down positively, that the disease (as its name implies) depends solely upon this disturbance, you will find in the many forms of hysterical affections that may be brought under your notice, that it will rarely happen that there is not some deviation from the healthy action of the uterus exhibited in the disturbance of the menstrual function. A large proportion of hysterical patients suffer from leucorrhœa; in others, the catamenia are insufficient in quantity, or occur at irregular intervals. Sometimes the menstrual secretion recurs at short intervals, and is very profuse, so that we have that condition to which the term "menorrhagia" has been applied. Perhaps there is an irritable condition of the uterus, causing almost constant pain and tenderness in the uterine region. No one of these conditions is constantly observed, but in almost every case of hysteria there is some form or forms of uterine disturbance.

Thus, then, we arrive at the conclusion, that the symptoms in Harriet B——'s case are to be referred to an hysterical state of constitution.

The case is a good example of one form of local hysteria, to some of the other forms of which I shall briefly call your attention.

Of all these conditions, that which has been called "irritable uterus" is by far the most formidable. It is characterised by exquisite pain and tenderness in the region of the uterus,—even the slightest pressure over the organ, or the least touch applied to it in the examination per vaginam, causes great suffering, and the patient shrinks in consequence. At the same time there is no enlargement or other organic change in the organ.

Another form of local hysteria, is a pain of very frequent occurrence under either breast, and, what is rather curious, more commonly found under the left than under the right breast. Leucorrhœa is so often concomitant with this pain, that whenever I find a patient complaining of it I invariably ask if she suffers from leucorrhœa or conversely; if leucorrhœa be present in any quantity and for any time, I am led to inquire about the local pain. That there is a connexion between the leucorrhœa and the pain in the side scarcely admits of a doubt, for the pain is more severe if the leucorrhœa be profuse, and it very commonly happens, that as soon as the healthy condition of the uterine functions has been restored, the pain will disappear. My theory of the production of the pain is this:—I believe that in cases of this kind there is not only an irritated state of uterus, but also of one or both ovaries, and the pain is more immediately associated with the irritable ovary, the nerves of which, implanted, as many of them are, in the spinal cord, reflect the irritated state on to the nerves of the submammary region. It is an interesting example of a reflected sensation.

A third form of local hysteria is one with which you should be familiar, and be able readily to diagnose. It manifests itself in that pain in the stomach which is commonly called "gastrodynia," which we must be very careful to distinguish from the pain resulting from ulcer of the stomach, as an essentially different treatment would be obviously applicable to each. One form of ulcer of the stomach very often occurs in young chlorotic women, amongst whom also we most frequently meet with the gastrodynia; hence the importance of paying close attention to the symptoms, which will enable us to distinguish with certainty the one from the other. An important difference is, that in the hysterical affection, the pain may occur at any or at all times, whether the stomach be empty or full; nor is there any constant relation between its development and the ingestion of any particular kind of food. On the other hand, the pain from ulcer of the stomach is distinctly influenced by the taking of food, but especially of that kind which it is the province of the stomach to digest. Patients with ulcer will tell you, that as long as they abstain from food, they have little or no pain; but as soon as they eat anything they begin to suffer, and they are not easy until digestion has been completed. Hysterical patients, on the other hand, will tell you, that the pain comes on as soon as they rise in the morning, and continues perhaps all day. You will also find that that these patients exhibit more or less of the hysterical constitution. With reference to the diagnosis between these two kinds of stomach pain, you should always inquire if there has been vomiting of blood, as this forms a most

important symptom in the history of ulcer of the stomach. Or, if there have been no vomiting of blood, you should inquire whether it may not have passed through the pylorus into the intestinal canal, in which case you will find, upon inquiry, that the patient has passed very dark matter from the bowels; the stools, in fact, exhibit a pitchy character in those cases in which blood from the stomach passes by the bowel. The effects of the treatment to which the patient is subjected will also often enable you to distinguish the true ulcer of the stomach. Beer and stimulants, and all acid drinks, greatly aggravate the pain from ulcer, while they often tend to relieve the hysterical affection. Bismuth acts very favourably in the one, but not so in the other.

Another form in which we find local hysteria manifesting itself is exhibited in that condition called hysterical spine. You have a good example of it in the patient whose case has led to these remarks. If you pass your finger down the spine you will find some places very irritable; perhaps the painful situation may be confined to one particular spot, or it may extend over three or four spinous processes, or the whole spine may be affected. Whichever be the case, yon will find that the patient suddenly shrinks as soon as the irritable part is touched, and appears to suffer, and no doubt does suffer, exquisite pain. Now, this condition has been over and over again mistaken by careless practitioners for caries of one or more of the vertebræ; and in consequence the unhappy patients have suffered from all the artillery of physic; leeches, blisters, and setons have been applied to the spine, and other antiphlogistic measures have been resorted to, but without any effect beyond, perhaps, aggravation of the pain. The most important point, by means of which you may distinguish vertebral caries from the hysterical affection, is this: in the vertebral disease the pain is not so excessive, and is always fixed in one part, and it will be found to increase gradually as the disease advances.

Hysteria likewise affects joints. A patient has a pain in her knee or her hip, or sôme other joint. I have no doubt that in these cases there is not only an affection of the sentient but of the muscular nerves likewise; for the muscles are either spasmodically affected, or relaxed, or paralysed, occasioning difficulty and awkwardness in the movements of the joint.

Many instances of what are called neuralgic pains are referrible to the hysterical state, and the case of Harriet B. is one of them. But you must take care to distinguish the true neuralgic from the hysterical affection. They are different diseases, although probably nearly allied. In the true neuralgia there is an altered nutrition of the affected nerve as decided as that of the tissues of a joint affected with a transient attack of gout. Such, however, is probably not the case in hysteria.

Our patient, Harriet B., has continued in the hospital for a considerable time. Repeated examinations tended only to confirm the diagnosis I have given, and she has had two or three hysterical fits. On her admission she was treated for the diarrhœa, under which she was then suffering. The diarrhœa ceased, but the pain remained unabated.

Since that time the treatment has been chiefly such as would check

leucorrhœa, improve tone, and promote general health. The tepid shower-bath, the cold hip-bath, mild aperients with galbanum, and the citrate of iron, were administered for some time. The result was a very marked improvement of the general health.

Notwithstanding this treatment the pain in the hypogastrium continued troublesome, although diminished in severity. Local treatment was employed; leeches, blisters, and opiate applications were applied, without good effect. At length, fearing that these applications tended rather to aggravate the pain by fixing her attention upon the affected part, which undoubtedly they are apt to do, I applied a blister to the corresponding spot on the left side, and kept it discharging for some time. This treatment was attended with the happiest result; the pain left the right side, but, as if in illustration of its true nature, she now complains of a pain in the left or blistered side, less severe, however, than the original pain. But from the great improvement in her general health, and the abatement which has already taken place in her symptoms, there can be no doubt that time is now the most important element in her cure.

[The second case was a most extraordinary one of its kind. This was in a woman, Amelia D., aged 38. The following graphic description is from the notes of Dr. Hyde Salter, the house-physician of King's College Hospital.]

On June 5th, about ten o'clock in the evening, (Dr. Salter states,) I was called to see a patient who had just been brought into the hospital by a policeman, who had found her speechless in the streets. I found a woman sitting in a chair, looking quite intelligent and coherent, although evidently in great excitement and distress; her expression was anxious, and she looked from one to the other in an inquiring and imploring manner; her teeth were fast clenched, and her lips parted. On being asked who she was, she shook her head; when asked what was the matter with her, she pointed to her mouth and masseter muscles; when asked if her jaws were locked, she nodded her head. I then tried with all my force to separate them, but could not; then I felt her cheeks over the masseters, and found these muscles contracted into hard knots, which sufficiently explained the closure of the jaws. When questioned as to the cause of the tetanus, she clenched her fist and struck her left cheek, implying that she had had a blow there. I said, "Have you had a blow there?" She nodded her head. We asked her if she could write. She shook her head, and clasped her hands in a despairing way. We then asked her if her husband had given her the blow. She nodded assent eagerly.

By degrees, putting all sorts of questions, and getting nods or shakes of the head, as the case might be, I learned that she lived in the neighbourhood of London, that she had been struck there by her husband that day at two o'clock, and that the blow was the cause of the attack; also that she was 38 years of age. All these things afterwards proved to be true. While answering our questions as well as she could, she suddenly, and without any warning, slid from her chair in a state of apparently complete insensibility, and would have fallen on the floor had

she not been supported. Then commenced a series of spasms more strange and horrible than can be conceived or described, tetanic and clonic, partial and complete, symmetrical and irregular, varied in every conceivable and inconceivable way. First she had opisthotonos, then she was thrown forwards, then she twisted round and writhed like an eel, then she would throw herself forward and raise herself into a sitting posture, then she would roll over and over, then a slow undulation or wave of spasm would pass over her from head to foot, producing different movements of her limbs as it passed down, like a dog dying of hydrocyanic acid poisoning."

You might almost be led to think that this description is overdrawn, but I can myself bear testimony to the accurate statements of the facts, as I was present during the greater part of the time. Then, continues Dr. Salter, "the tonic spasm would suddenly become clonic, and she would throw out her arms and draw them back with great force. The legs would be affected in a similar way, or drawn up to the body, so that the heels were close to the buttocks, or thrust stiffly out. When holding her hand she would suddenly clutch mine with such force that I could not disengage it. Meanwhile, her face was undergoing all sorts of contortions, at one time expressing rage, at another intense fear, then a sneer, then a fixed and rigid stare; the eyes might be rolled upwards or downwards; the pupils dilated, and insensible to light; then the elevators of the upper lip and ala of the nose would jerk, perhaps on one side or both, exposing the teeth. The depressor anguli oris would draw one corner of the mouth down on the chin, or the platysma throw the skin into a state of rigidity"; but, as Dr. Salter remarks, it is quite impossible by description to convey any accurate idea of the extraordinary contortions of the patient.

One of the most remarkable features in the case was the rigid tonic condition of the whole muscular system. Every muscle employed in any movement became at the same time as hard as a board, and the movement was not so much executed with rapidity as with great force and even slowness. But in watching her attentively, it was plain that the movements, varied and irregular as they were, did not partake strictly of the character of involuntary movements. They were evidently influenced by a will, but by a diseased and ill-directed will. While these spastic movements of the muscles continued, there appeared to be complete insensibility to surrounding objects; but when they ceased, her intellect seemed quickly to recover itself, and she could talk freely and collectedly. At this time she gave us her history, which we afterwards ascertained to be correct. In the midst of her narrative, her eyes suddenly became fixed, and she stared at us for a short time and fell off into another paroxysm, and went through the same series of varied movements and contortions as before. She continued in this state, alternately in fits and quiet, for nearly two hours, and then slept.

Now, on being called to a case of this kind, you would have, on the spot, to decide upon its real nature, without the help of any history on which full reliance could be placed. Such was our case when we first saw this patient; and, therefore, before I give you any further details of the case, I shall state to you the conclusion arrived at by Dr. Salter and

myself, and the grounds of our decision. We had to distinguish these extraordinary muscular movements from the state of trismus, of tetanus and from epilepsy.

The distinction from trismus was sufficiently easy. The fact of her coming to herself so soon, and the subsidence of the spasmodic action of the muscles, was quite sufficient to enable us to diagnose that the condition was not trismus, and the absence in the history in all those causes which ordinarily give rise to this affection also tended to the same conclusion. In the same way that we were enabled to say that we were not dealing with a case of trismus, we also came to the conclusion that the case was not one of tetanus. Trismus and tetanus are but degrees of the same affection. In both diseases the muscular movements are distinctly involuntary, and often excited by the application of some stimulus to the surface. In this case, however, the movements bore a decided resemblance to the voluntary class, and could not be excited at the will of the observer.

At first sight, the affection bore a greater resemblance to epilepsy than to any of the other forms of convulsive disease; but there were certain distinctive features, which enabled us very positively to decide that it was not epilepsy. These were the nature of the movements, and the affection of the consciousness. The movements partook more of the tonic than of the clonic character; and although at times very much varied, they were combined and regular, and, as it were, directed to an end and by a purpose, rather than irregular, rapid, and, as it were, explosive, as is the case with the convulsions of epilepsy.

The most important feature was the state of the consciousness, and by this chiefly we were enabled to decide against the epileptic nature of the case.

In epilepsy, complete coma, with total loss of consciousness, forms an essential and specific character. Convulsions form no necessary part of of the epileptic paroxysm. There may be in epilepsy a complete absence of convulsions, but the insensibility is invariably present. Thus we often meet with instances in which there is sudden and even momentary loss of consciousness, without any convulsion whatever. Such cases are not less truly examples of the epileptic paroxysm, than if the most violent convulsions were also present. Attacks of this non-convulsive kind constitute what the French call *petit mal:* but, in many instances, it is rather the *grand mal,* for the brain and the intellectual powers suffer much more after repeated attacks of this nature than after fits in which the convulsive movements formed the prominent feature of the disease.

In the case before us, however, we had no complete loss of consciousness; there was, undoubtedly, an affection of consciousness, that in which a person may be insensible to all ordinary external stimuli, and quite without any perception of anything going on around her, but at the same time she was aware of the altered state of her mental powers. But in epilepsy the patient knows nothing of his mental state during the paroxysm—he is only conscious of his state before and after it—and the period of the fit is to him as if it had never existed.

The nature of the movements showed that consciousness was not

wholly in abeyance; they exhibited a co-ordination and a regularity which we never observe where there is complete loss of consciousness. She bent her fingers in a steady regular manner, as if the muscles were obeying the mandates of her will. and her body was contorted by a combined movement, forming a striking contrast with the jerking movements which we see in a state of insensibility. I say, then, that in this and in other cases of a similar nature we have no complete loss of consciousness; the apparent insensibility depends upon an intense concentration of the attention on one particular object. I may illustrate what I mean in this way. We all know that when the mind is very much interested and occupied with any particular subject or train of thought, one is very apt to take no notice of occurrences which are taking place close to, or in immediate connexion with, one's person; one is frequently unconscious of noises, nay, we may even suffer a moderately severe pinch without being sufficiently roused from our reverie to enable us to direct our attention to any but the one object with which we are engaged; in fact the mind is fixed on one object to the complete exclusion of everything else for the time.

The state of consciousness into which patients of this class fall is of this kind, although very different in degree. What is commonly called "absence of mind" is an analogous affection of consciousness. Attacks of this kind are generally brought on by some powerful mental emotion —grief, anger, jealousy—which overwhelms and suspends all other intellectual operations while its influence lasts.

Then if the disease were not trismus, nor tetanus, nor epilepsy, what was it? All the symptoms and the history of the case combine to show that it was an example of a highly developed hysterical paroxysm or fit, or, more exactly, of that peculiar form of aggravated hysteria, which is called *catalepsy*.

The history of the case, which has been collected and recorded by my clinical clerk, Mr. Maurice Davies, shows that our patient was a highly excitable hysterical person, who has been subjected to moral, and perhaps physical influences also, well calculated to keep up that state. She tells us that she enjoyed good health until she reached the aged of ten, when she experienced a sudden fright, and fell, in a fit, two storeys down a well staircase; from that time to the time of her marriage (at the age of 15) she had the fits uninterruptedly, generally twice a week, and sometimes oftener. Since her marriage she has had the fits less frequently, but has never been entirely free from them.

It is difficult to determine what was the precise nature of these fits, whether they were epileptic or hysterical. Her age was more favourable to the former; but the subsequent history, and the fact elicited from her, that she was advised to marry in order to get rid of the fits, rather indicate that they were of the hysterical kind. At the same time, it is very unusual for a girl of ten years old to exhibit any symptoms of hysteria. We rarely find any manifestation of the hysterical condition until after the appearance of the catamenia. She was persuaded to marry at the age of fifteen, and, as she had no great affection for her husband, domestic squabbles occurred very soon after their union, and in some of these disagreements her husband used violence, and in conse-

quence she had a return of the fits. At last they agreed to separate, but circumstances obliged them to have occasional interviews, and of necessity scenes of violence were repeated on each occasion. It was at one of these rencontres that the present attack commenced. The influence of moral causes in inducing the attacks is very manifest in this history. Ever since fifteen years of age, she stated that the slightest excitement would bring on a paroxysm. She is evidently a woman of strong passions and violent temper, and possibly her partner was as much "sinned against as sinning." She exhibited features of the same hysterical cast as in the case of Harriet B., with which I commenced the lecture, and many of the same peculiarities of the hysterical constitution.

There is a curious family history in this case. Her paternal grandfather and paternal uncle had fits, and she was the mother of nine children, eight of whom died, seven of them in convulsions!

And now let me refer briefly to *treatment.* I would just remark here that the same general principles of treatment are applicable whether the affection be chiefly manifested in a particular part of the body, as in the case of Harriet B., or whether it affects the system generally, as in the case of Amelia D.

Before, however, we discuss the treatment, we must endeavour to form some notion of the nature of hysteria. What is this hysterical condition? To answer this question properly would, I fear, occupy me too long, but I may tell you what it is not, by which you may be guided in your practice, and be enabled to meet the disease by the proper treatment. Now, in the first place, hysteria does not result from inflammation. It is not a disease of an inflammatory type, and no part of the system whatever is in a state of inflammation. Hysteria, no doubt, occurs chiefly in persons who have a peculiar character of nervous system; very often inherited from nervous or gouty parents. It depends partly upon this original conformation of nervous system, and partly upon a depraved state of general nutrition affecting the whole system, and accompanied by a morbid state of the blood. It is always very much influenced by a disordered condition of some of the great emunctories of the body. Hence we must take care that the powers of the patient are not in any way diminished by the treatment to which she is subjected, or by the occurrence of any fluxes from any part of the body which may tend to lower her strength. We must also be careful not to overlook any derangement of the digestive organs; we must uphold the strength, and endeavour to improve the patient's health in every way that comes within her powers of digestion.

When you meet with a case like the present, in which a violent paroxysm occurs, what are you to do? Are you to look on, and do nothing? The friends will anxiously inquire if nothing can be done to relieve the patient. I confess that I cannot tell you of any means which will cut short the paroxysm, but at the same time you may try certain means to alleviate it. Rousing the patient is often of use—shaking her or throwing cold water in her face, or well splashing her with water is of more use. After she has come to, you should get the bowels to act freely. Means of this kind were freely used in the case of Amelia D.,

and an enema containing half an ounce of spirits of turpentine and an ounce of tincture of assafœtida was administered. She took likewise for a short time, twenty minims of the fetid spirit of ammonia, and ten minims of tincture of hyoscyamus in camphor mixture every third hour.

If the patient has been indulging too freely in spirit (as is often the case with persons brought into the hospital) the stomach-pump will be of great service. It rarely happens that taking blood or other antiphlogistic treatment can be called for.

The patient, Amelia D., recovered in three or four hours from her fits, and slept the rest of the night. Next morning she was perfectly tranquil, and could not be prevailed on to remain in the hospital.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 1.

15.—ON THE PATHOLOGY OF AFFECTIONS ALLIED TO EPILEPSY.

By Dr. C. B. Radcliffe.

[In a paper published in 'The Lancet,' Oct. 30, 1852, Dr. Radcliffe endeavoured to show that epilepsy was due rather to deficiency than excess of stimulation supplied to the muscles; and he now proposes to show that other allied disorders proceed from the same cause. He first makes a few remarks upon such as are of a chronic character.]

All muscular disorders admit of being divided into three categories—the tremulous, the convulsive, and the spasmodic; and this division forms the groundwork of the subsequent remarks.

1. In ordinary tremulousness, the temperament or predisposition is obviously distinguished by delicacy; it is the feminine, in contradistinction to the masculine habit of body. In palsy, the shaking goes hand in hand with unequivocal marks of decrepitude and decay—the listless wish, the snowy head, the fireless countenance, the wasted limb, the feeble pulse. In chorea, and in very bad tremulousness, the general condition is very similar. This affection is almost peculiar to females, and to females whose parents were infirm or aged, or who themselves had become enfeebled by improper or injudicious habits. It often originates during some severe and exhausting disease, or in the period of convalescence, and is always attended by signs of debility. In old cases these signs are very decided: the muscles are soft and pale, so as to bear some resemblance to the muscles of white-fleshed animals; they are also easily tired and tardily repaired. The face, lips, and tongue are pale; and not unfrequently the atony of the circulation is further indicated by pastiness of the skin, effusion in the serous cavities, rheumatic deposits, and other indications of a watery and depraved blood. In mercurial trembling the general state is intimately akin to that of general palsy or aggravated chorea; and in bad cases every faculty of the body and mind is completely shattered. In ague, the general strength is much impaired, and this impairment is in proportion to the severity and frequency of the paroxysms.

2. The hysteric convulsion is connected by its name with women, and by facts with women who are more than usually delicate, or with men who are in the same predicament. The convulsion of teething is equally connected with delicacy, for it is certainly true that this symptom manifests itself in weakly rather than in strong children, and in weakly children almost in proportion to their weakliness.

3. The state of system in chronic spasmodic affections is virtually the same. The liability to cramp is always associated with tremulousness. It increases with the advances of age, and is almost permanent, when occasional tremors are prolonged into palsied tremors. The cramps of lead-poisoning are connected with a remarkable degree of wasting and atrophy, particularly in the muscles. The subjects of catalepsy, in like manner, are much more delicate and impressible than they ought to be. Their skin is usually pale or dingy, their pulse readily disturbed, their general appearance either hysterical or apathetic. A cataleptic boy, lately under my care, (the particulars of whose case were reported in 'The Lancet' at the time,) was as irritable, uncertain, and fretful as an infant. His apprehension was slow, his memory weak, his head large, his eyes staring, his pupils dilated and sluggish, his complexion sallow and venous, his hand cold and clammy, his pulse slow and feeble.

As with epilepsy, therefore, so with these forms of chronic muscular derangement, the conclusion is, that the disorder is manifested in a state of general weakness and atony, and not in one of health and vigour.

In order to arrive at the knowledge of the real nature of the several affections allied to epilepsy, we now proceed to examine the condition of the vascular, nervous, and muscular systems in, and the nature of the causes operating upon, these affections.

What, then, is the condition of the *vascular system?*

1. In ordinary tremulousness, in palsied shaking, in mercurial tremor, and in choraic agitation, the circulatory powers are always depressed. A flushed face and a bounding pulse are never present. So also with the tremulous movements before and after fever. Rigor is coincident with a sense of coldness, a feeble pulse, a sunken countenance, a corrugated skin; subsultus, with a circulation faltering on the very verge of stagnation. Nor is this coincidence accidental. It is not—because the rigors disappear as the system rallies, and cease when the pulse and heat return. It is not—because they reappear in the form of subsultus when the feverish turmoil is past, and death at hand.

2. In convulsion the real state of the circulation is more masked than in tremulousness. It is so in hysteric convulsion. In an immense number of these cases the circulation is in a state of syncope, or virtually so; but is this the rule? Is the pulse never excited? So far as we know—never. Fluttering there may be, and often is, and this fluttering may be confounded with excitement, and called by the same name, but there is never true excitement. Convulsion and collapse, and not convulsion and fever, go together; but we leave this question in abeyance for the present.

The condition of the vascular system in the convulsions of fevers or inflammations is in no way obscure. These convulsions appear in the initial cold stage, or in that of final prostration, and never during the

height of the disorder. They appear only when that cold stage is unusually severe, as in cases of malignant small-pox or puerperal fever, or when that final prostration is rapidly deepening into actual dissolution. They disappear with unfailing regularity whenever the system rallies, whether this be in the ordinary course after the incipient collapse, or in returning health after the fever. It is so also with the convulsions of the fevers or febrile affections of childhood. They take the place of rigor or of subsultus, and invariably avoid the hot stage. So again in the inflammations of childhood, they occur before and after, but never during the hot stage. In inflammation of the brain, for example, the malady frequently commences in convulsions; after this, the system rallies, inflammation is developed, oppression follows, then prostration, and when this is deep enough, convulsions return to close the scene. In the inflammatory irritation of teething, the little patient is in a state of hectic exhaustion—now cold, now hot—the skin dusky, and the pulse scarcely perceptible, when the convulsion happens. The great source of error in all these cases is the double-meaning of the words fever and inflammation, each of which includes two diametrically opposite conditions of the vascular system—collapse and excitement. It is this double-meaning which has contributed more than anything else to confuse the true knowledge of muscular pathology, for if, discarding these words, care had been taken to note whether the phenomena in question were coincident with collapse or excitement, we should long ago have been rid of much obscurity and perplexity in these matters.

The state of the circulation in the convulsions of death, and particularly of death by hemorrhage, is manifestly one of the lowest conceivable depression. The blood escapes from the vessels until they are well-nigh empty, or the vital heat is chilled by commencing death; these are the changes which have come over the circulation under these circumstances.

In the great majority of instances, therefore, convulsion is coincident with, and dependent upon, the very reverse of vascular activity; and, this being the case, we must claim the benefit of the doubt in any individual case in which doubt may exist, as in some forms of hysteric convulsion.

3. The state of the circulation in spasmodic disorders is more easily understood than it is in convulsion. The pulse is particularly feeble in cramp. Thus, in a child at present under my care, whose feet and hands have been liable to cramp on exposure to cold, the cramped parts are perfectly cold and white, and the most careful examination cannot detect any pulse at the wrist or ankle; and, after the cramp has passed off, the pulse is most miserable, and not to be detected without difficulty. The pulse also is often imperceptible in the cramps of cholera, and always extremely feeble. It is as in the rigors of fever, with which these spasms are analogous; only in this case coolness has become coldness and clamminess, the wrists are pulseless, and paleness has deadened into sallowness and blueness.

In catalepsy the appearances are so death-like as to suggest the idea that the blood is stagnant. Dr. Watson says, the patient, in such case, "looks like a waxen figure, or an inanimate statue, or a waxen corpse," and this was certainly so in the case to which I have already referred,

as falling under my own care, for here the catalepsed parts were cold, pale, and pulseless, or nearly so.

The state of the circulation, in tetanus, may be illustrated by two recent cases, which cases are not the less fitted for our purpose because they were reported with a different end in view. One of these was sent to 'The Lancet' by Mr. Salter, of Dorset. It was that of an old man, upwards of seventy three years of age, whose foot had been partially destroyed in a threshing-machine. The spasms set in after a prolonged employment (for three or four days) of strong purgative mixtures of salts, senna, and tartar-emetic, along with morphia and aperient pills. During the spasms, the injured foot was pale and numb, the skin moist, the countenance cadaverous. The state of the pulse is not specified; but what this was is to be inferred from the foregoing particulars, as well as from the adoption of vigorous stimulation, with brandy and ammonia, when the spasms occurred. Indeed, in a man so old, so injured, and so antimonialized and purged, only one conclusion is possible—namely, that the circulation must have been very greatly depressed. This appears, also, from the sequel, which was this: under the new mode of treatment the system rallied, and the tetanized parts relaxed; and this rallying and relaxation lasted for several days, at the end of which time the symptoms relapsed. This was after an exhausting and agitating interview with some friends. Again stimulants were had recourse to, and again the spasms disappeared, not to return. In the relapse, the pulse is stated to have been extremely feeble, and of a typhoid character. The second case is by Mr. Sanger, of Alfreston, in Sussex. In this patient, the state of the system is stated to have been such as to contraindicate the use of any lowering measures, the spirits being faint and low, the countenance anxious, the pulse 98 and weak, and so on. Quinine, ammonia, and turpentine were had recourse to; and the result of the treatment was, that the system rallied, and the spasms subsided. These instances illustrate the large body of cases of tetanus, for certainly the majority are in no way complicated with any kind or degree of vascular activity; but do they illustrate the rule? Are there no exceptions, in which there are plethoric or other active symptoms? The answer, as it seems to us, is clearly in the negative. It is stated by all authorities, and must be evident to all who have had any experience in the disease, that there is *no fever* in tetanus; and this, of itself, is almost sufficient to prove our position; for so anxious have medical men been to find some fever in maladies of this class, that to admit its absence is almost equivalent to admitting the opposite. Undoubtedly the vascular state in tetanus assumes many aspects, and some of these are such as to deceive an unpractised eye or an impatient finger. There can be no mistake in cases such as have been described, but there may very readily be in irritable subjects. In such persons, owing to the excitement of the examination, or some unusually severe pang at the moment, the pulse, when first felt, may beat with considerable force and fulness, and so give rise to an impression of fever or plethora; but this rapidly passes off, and the colour fades, and the pulse flags and falters. The pulse, indeed, is eminently changeable, and any excitement which may be manifested in it is quite momentary, in comparison with the

almost constant state of depression. It must also be borne in mind, as confirming the same view, that in fatal cases the spasms of tetanus continue, and often increase, in spite of the progressive failure of the circulatory powers—a fact which is only explicable on the supposition that the spasms are dependent upon the very reverse of vascular activity.

The same conclusion arises also out of the consideration of cadaveric rigidity, for in this case we have a state of tetanoid, or rather cataleptoid contraction, which subsists with stagnation and death of the blood, and which endures untiringly until the muscles are broken up by incipient decay.

In spasm, therefore, as in tremulousness and convulsion, there is abundant evidence of a decided lack of circulatory power. It would seem, also, as if that lack were greater in convulsion than in tremulousness, and in spasm than in convulsion.—*Lancet, March* 19, 1853, *p.* 264.

16.—CASE OF THE BENEFICIAL EFFECTS OF STRYCHNIA IN IMPAIRED SPINAL ENERGY.

By Dr. Marshall Hall, F.R.S., &c.

[In remarking upon this case, Dr. Hall says,]

Such cases occur from causes of nervous exhaustion, such as excessive study, muscular effort, sexual indulgence, &c.; and in such cases strychnia has appeared to me the appropriate and useful remedy.

This agent acts distinctly on the spinal marrow. In excess it induces spasmodic affection. It is therefore contra-indicated in cases of *irritation* of this nervous centre and of spasm. Its appropriate use is in spinal *exhaustion.* It constitutes one of our best tonics, improving the general health, and conducing to the recovery of strength and flesh.

I have given it in minute doses thrice a day, in the midst of meals, for many months. The following is the formula which I have adopted :—
℞. Strychniæ acetatis, gr. i; acidi acetosi, ♏xx.; alcoholis, ʒij; aquæ distillatæ, ʒvi. M.

Of this, ten drops, containing one-fiftieth part of a grain, may be given thrice a day; but I have generally begun with five, and gone on to fifteen.

In two cases only have I known it to disagree. It seemed to affect the head. In many the patient has improved in looks, as in general health and strength, without experiencing anything but good from it.

I am giving the strychnia a cautious trial in the epilepsy attended by pallor, thinness, and nervous exhaustion; in the paraplegia the result of sexual excesses, and in which neither pain nor spasm has occurred; and in the paralysis agitans.—*Lancet, Nov.* 27, 1852, *p.* 486.

[In another paper, Dr. Hall says,]

I have been recently engaged in some experiments on the effects of strychnia and their remedies. I can only give a brief notice of them at the present moment; on a future occasion I will give the experiments themselves, with their interesting details.

The effects of the acetate of strychnia show themselves under *two* forms or degrees, according to the dose of the poison in relation to the powers of the animal: these are—(1) the *milder*, and (2) the *severer*.

If a dog be placed under the milder form of strychnism, it passes into a condition of extreme spinal excitability. If, when in this state, it be continually excited, like the frog under a similar influence, it certainly dies; if, on the contrary, it be placed in a position of absolute quiet, it as certainly recovers—facts which suggest our principle of the treatment of tetanus and of hydrophobia.

If the animal be placed under the severer form of strychnism, a different series of phenomena occurs. In the violence of the paroxysm, extreme laryngismus, extreme efforts at respiration, apoplexy, asphyxia, death, occur—unless one measure be adopted; that measure is—*tracheotomy!*

Left alone, the animal would infallibly *die*—of laryngismus; tracheotomy being performed, he lives!

But the patient affected with hydrophobia—and *all* hitherto so affected *have* died—have died of laryngismus. Now of laryngismus he *would not* die, if efficient tracheotomy were performed: would he, then, die?

I must add, in connexion with this last remark, that a dog, saved from the effects of larnygismus by tracheotomy, did afterwards die of exhaustion.

I repeat that all patients afflicted with hydrophobia have died hitherto; that all have died of laryngismus; that of laryngismus they need not die, and will not die, if tracheotomy be performed!—that is, no patient need die from the cause from which all hydrophobic patients have died hitherto.

If tracheotomy be performed, will the hydrophobic patient die? This question cannot be answered without an appeal to experiment. As the animal affected with the severer form of strychnism was saved from the first effects of the poison, yet died afterwards of exhaustion, the hydrophobic patient may die of ulterior effects of the poison. Even then, the terrors of this most terrific of diseases—the fits of strangulation and of suffocation—will be averted.

From the experiments to which I have adverted to two practical inferences are deducible:—

1. Let the tetanic patient be preserved from all external excitement absolutely.

2. Let the hydrophobic patient, whilst equally preserved from excitement, be submitted to efficient tracheotomy.—*Lancet, Feb. 5*, 1853, *p.* 128.

17.—*Formula for Tic Doloureux.*—[Mr. J. Wilson Beaumont, of Mirfield, Yorkshire, speaking of the value of the following combination says,]

It is one for which I do not for a moment claim novelty; but having seen so much good from it, I cannot forbear, on grounds of humanity and benevolence, from communicating it to others. It is as follows:—

℞. Ferri potassio-tartratis ℈ij; vini opii ♏lxxx; aquæ cinnamomi ℥viii. M. Ft. mist.

Give two tablespoonfuls three times a day, or three tablespoonfuls at once, if the pain be very severe.

I do not pretend to say *why* this particular combination should be *apparently* so much better than others, but certainly I have not known it yet to fail.—*Association Med. Journal, Feb.* 11, 1853, *p.* 137.

18.—*Neuralgia.*—Cazenave recommends in facial neuralgia an ointment composed of chloroform 20 parts, prussiate of potash 10 parts, and lard 60 parts; a piece the size of a walnut to be rubbed over the painful part. An oiled silk cap is then to be worn some hours.—*Brit. and For. Medico-Chirurgical Review, April,* 1853, *p.* 573.

DISEASES OF THE ORGANS OF RESPIRATION.

19.—ILLUSTRATIONS OF LARYNGEAL AND PHARYNGEAL DISEASES, WHICH ARE FREQUENTLY MISTAKEN FOR, OR ASSOCIATED WITH, PHTHISIS PULMONALIS.

By Professor Bennett, Edinburgh.

[In the first case related by Dr. Bennett, although no disease or abnormal sound could be detected in the chest, yet the patient, a gentleman, had hawked up from time to time a small clot of blood about the size of a pea. He remarks:]

The origin of the blood in this case appeared to me at that time to be very mysterious. It was not florid. There was no reason to suppose it to be of pulmonary origin. There was nothing in his voice to indicate laryngeal disease. I did not examine the pharynx, not being then aware of the importance which ought to be attached to it. I was consequently left in great doubt as to the origin of the blood, and of the best means of removing anxiety from my patient. My uncertainty, however, was partly dispelled by the following case:—

I was requested by an assurance office, in July 1850, to examine the chest of Mr. M., a merchant, aged about 30, who said he laboured under no kind of complaint, with the exception of occasional sore throat, and expectoration of mucus tinged with blood. He was tolerably stout, took long walks without uneasiness, and suffered from no difficulty of respiration or from cough. Repeated examination of his chest failed to elicit any physical sign indicative of pulmonary disease. I therefore certified that his lungs were healthy. In October 1851, this gentleman called upon me again for advice, under the following circumstances. The soreness of the throat had latterly increased, and considerable cough was induced, after which he spit up mouthfuls of purulent matter, frequently tinged of a red colour. He brought me some of this sputum

to examine, which consisted of mixed blood and pus, of a dirty brick-red colour. Examination of his chest again convinced me that the lungs were unaffected; but in the interval I had paid attention to the writings and practice of Dr. Horace Green, of New York; and I now examined his throat, when the cause of his symptoms was at once apparent. The fauces and upper part of the pharynx were studded over with nodular swellings, varying in size from a pin head to that of a pea. Many of them were bright red and fungoid in character, probably the origin of the extravasated blood, whilst considerable patches of purulent matter adhered to several parts of the mucous membrane. I applied a sponge, saturated with a strong solution of the nitrate of silver, to the affected parts. In three days he returned, having been much relieved, when the application was repeated. I have not seen him since.

These two cases convinced me that certain symptoms which have hitherto been considered as indicative of phthisis might have their origin entirely in the fauces, pharynx, and upper part of the larynx. The cough so occasioned, with the purulent expectoration, often tinged with blood, frequently so resembles that occasioned by phthisis, as not only to induce alarm in the minds of the patients, but frequently to mislead the medical practitioner. I have now met with many such cases, which have been mistaken for phthisis, and which have been treated for that disease without any effect, until local remedies were applied, when they, for the most part, disappeared, or became much better.

[In a second case, that of a female aged 25, there were all the symptoms of phthisis present—frequent cough with hemoptysis, copious purulent expectoration, night sweats, and loss of appetite with vomiting. On examining the fauces they were found covered with purulent mucus. The cough was also ascertained to be convulsive, and a ringing sound was heard over the larynx on inspiration. Laryngitis was the disease diagnosed. The solution of nitrate of silver (℥ ss. to ℥ j. of water) was applied to the fauces, and afterwards the sponge was introduced into the larynx, with some degree of benefit. Blisters to the larynx were also applied; and as the disease seemed to have a syphilitic origin, iodide of potassium and bitter infusions were the internal remedies resorted to. This patient, though not cured, was considerably relieved. Dr. Bennett concludes by saying,]

The cases now given, with others that might have been adduced, have satisfied me that lesions of the pharynx and larynx ought to occupy the serious attention of the practitioner in all cases of pulmonary diseases, and that the following practical conclusions may be drawn from them:—

1st, That not unfrequently diseases, entirely seated in the larynx or pharynx, are mistaken for phthisis pulmonalis.

2d, That even when pulmonary phthisis exists, many of the urgent symptoms are not so much owing to disease in the lung as to the pharyngeal and laryngeal complications.

3d, That a local treatment may not only remove or alleviate these complications, but that, in conjunction with general remedies, it tends in a marked manner to induce arrestment of the pulmonary disease.—*Monthly Journal of Med. Science, Dec.* 1852, *p.* 513.

20.—WHAT IS TUBERCLE? WHAT IS PHTHISIS?

By Dr. W. Jenner.

[It is strange, says Dr. Jenner, that even at this day we are obliged to ask this question. Has it not been satisfactorily answered by every author who has written on this subject within the last quarter of a century? It would seem not, and therefore for our instruction, Dr. Jenner in reviewing the works of Ancell, Cotton, Virchow, Henle, Reinhardt, and others, gives us an epitome of the opinions held on this subject. He says:]

The opinions now held in regard of tubercle may be divided broadly into two classes; the first is, that tubercle is an exudation essentially pathological in character. "It is beyond doubt," says Rokitansky, "that tubercle is an exudation." The second, that tubercle is merely a retrograde metamorphosis of pre-existing structures. This latter notion is strongly advocated by Virchow, in the papers before us.

The opinions referred to, however, readily admit of more minute division; and for the purpose of enabling us, in a subsequent article, to estimate what amount of the truth they respectively contain, we shall here briefly describe them under five heads.

1st. Tubercle is a specific exudation poured out under the influence of a special general pathological state; in other words, it is the local anatomical expression of a definite constitutional affection. Or, as Mr. Ancell says: "As healthy blood supplies a blastema or succus nutritivus for healthy nutrition, tuberculous blood supplies a tuberculous liquor from which tubercle is formed."

Lebert's statement, that he had discovered in tubercle a peculiar and distinctive microscopic element—a tubercle-corpuscle—appeared to give force to this view; and coinciding as it did with opinions previously entertained, was received in this country as strong evidence in favour of the favourite creed. If this opinion be correct, tubercle ranks pathologically and anatomically in the same order as cancer, there being in both a specific constitutional disease, a specific exudation, and a specific or distinctive cell.

The truth or falsehood of this view will come hereafter to be examined.

2. Tubercle is a degraded condition of the nutritive material. Some pathologists, as Dr. C. J. B. Williams, refer tubercle to a "degraded condition of the nutritive material from which new textures are formed," and hold that tubercle differs from fibrine or coagulable lymph not in kind, but in degree of vitality and capacity for organization. Examined microscopically, tubercle contains, according to Dr. Williams, a few irregularly-shaped, shrivelled cells, with imperfect nuclei, the main substance being composed of granular or amorphous matter. "No fibres are," he says, "perceptible."

3. Tubercle is composed of the products of inflammation. Reinhardt is at once the most recent and able advocate of this opinion, and the high reputation as a microscopical observer he enjoyed among those most intimately acquainted with him, recommend his statements to our attentive consideration. Reinhardt sees in tubercle only the products of chronic and repeated inflammations. In some cases of chronic pneumonia, Reinhardt found a gelatinous fluid in the cells and interstitial tissue, containing epithelium and pus. At a later period the epithelium was in

a state of fatty degeneration; the fluid was diminished in quantity; the interstitial tissue contracted; the cells lessened in volume; and, finally, a a kind of cicatrix was formed. In various stages these states have been termed, respectively, gelatinous infiltration, gray tubercle, and tubercular cicatrix. In other cases of so-called yellow tubercle, Reinhardt found pus in the air-cells; the pus became thickened, dried up, and the nuclei disappeared. Shrivelled pus-cells, and not nuclei which have become free, form the so-called tubercle-corpuscles. Although Reinhardt considers that in some instances the tuberculous process arises from local causes—viz., hyperhæmia and recurrent inflammation; yet he admits that in many cases these indicate a state of dyscrasia.

4. Tubercle is composed of dead-tissue elements: such is Henle's opinion. In the lungs, he says, tubercles are bloodless, dead (nekrotesche) lobules, gorged with the dried-up elements of the epithelium or with pus, heaps of granules and granular cells, and these dead lobules continue in connexion with the sound pulmonary tissue, as a withered limb may with the trunk.

"The corpuscles," he says, "which are found most frequently and in the greatest number in miliary and crude soft tubercle, and which have generally been described as specific, are the corpuscles named by me 'elementary corpuscles,' and they belong to that variety of these which is rendered pale and dissolved by acetic acid. I have proved," he continues, "that such forms arise out of cytoid corpuscles long exposed to the air." And, further on—"The microscopic analysis renders it probable that the nucleated cells arise out of the epithelium of the air-cells; it offers no explanation as to whether the cytoid corpuscle, the products of the development of which we find in the air-cells, arise out of bronchial mucus, or from the pus of a circumscribed inflammation, or from extravasated blood.

Tubercle corpuscles have already been stated by Gulliver to be "effete and shrunken primary cells"–a definition which might be adopted by Henle.

These views of Henle agree in the main with those propounded, in 1843, by Dr. William Addison:—"A tubercle," says Dr. W. Addison, "involves or includes in its substance the vesicular structure of the lungs: minute bloodvessels, lobular passages, and air-cells, are all capable of demonstration on the dissection of tubercle under a Coddington lens; the bloodvessels are no longer permeable, but their presence may be demonstrated." Tubercles themselves are composed of abnormal epithelial cells. Henle maintains that gray granulations are imperfectly coagulated fibrine, and if they sometimes pass into yellow tubercles, cannot be considered as their first stage. He discards the idea of a specific exudation, and advocates the opinion that the first change, as far as the lungs are concerned, is coagulation of blood in, and obliteration of the vessels consequent on, defective capillary circulation, arising from imperfection of the respiratory movements.

5. Tubercles are composed of metamorphosed organized elements—a metamorphosis co-ordinate with the fatty and the waxy degenerations. This is the opinion of Virchow. His views are developed at some length in the papers placed at the head of this article; and as they contain much that is peculiar and novel, we shall enter into them somewhat fully.

To do justice to the opinions of Virchow we shall first describe what we understand him to mean, and then give his own summary of his opinions in the words he has himself used in one of the papers above mentioned.

A tubercle is composed essentially of dead tissues, the death of the part being occasioned by the accumulation of cells amid its vessels, and consequent compression of those vessels and cessation of the circulation through them. The cells which thus play so important a part in the formation of tubercle may have their origin,—

1. In the physiological cells of a structure or organ. The mode in which the increase in these cells takes place may, he says, be exquisitely perceived in the lungs. The first step in the tuberculous metamorphosis in these organs in an increase in the epithelium of the air-cells by endogenous formation. "I have seen," Virchow says, "cells with five large, oval, granulated nucleolated nuclei." Subsequently the "cells fall to pieces, a granular detritus is left, in which the nuclei remain for some time as shrivelled irregular opaque bodies, finally these also crumble, and an entirely amorphous finely granular mass remains behind." It is these nuclei, shrivelled, irregular, and opaque, which, in Virchow's opinion, constitute the tubercle-corpuscles described by Gluge and Lebert. "*They are not,*" he says, "*exudation-corpuscles.*" "The peculiarity of the local process lies in the tendency of the organization, and by no means in a peculiar exudation." In *lymphatic glands* affected with so-called scrofulosis, there is hypertrophy of the elements of the part through endogenous nuclei formation. The cells enlarge to five or six times their normal size, and as many as twelve pairs of nuclei may be seen in the same cell. The nuclei probably increase in number by cleavage into pairs. What share an exudation takes in this change, Virchow says, he "cannot decide." Still he maintains that tubercle is not developed exudation, but merely metamorphosed pre-existing tissue-elements—elements to which, in their primary state, the name of tubercle could not be applied; and that, consequently, the tuberculous metamorphosis is not the mark of a specific process, of a particular constitution.

2. The cells by the accumulation of which the vessels are compressed and death of the part produced may have their origin in the endogenous development, or in atrophy of the cells of cancer, pus, or typhous matter, but not in their simple desiccation.

3. These cells may be developed in the fibrine poured out in what is termed tuberculous inflammation. Is the tubercle here formed directly of inflammatory exudation-matter? Virchow says, No: the whole mass of fibrine passes on to organization; but while "one part develops itself into uniting tissue and vessels, another forms nucleated and cellular formations, which rapidly increase by endogenous growth, so that their number at some points is very great, and the amount of the endogenous nuclei is occasionally even colossal." The subsequent steps of the process—*i.e.*, death of the part, disruption, atrophy, shrivelling, and desiccation of the cells, are the same in all three cases.

But although all pathological and all physiological cell-growths may thus tuberculize, yet there is a local process which leads to the exudation of a material, the cells resulting from the development of which,

whether they be physiological or pathological, so constantly tubercularize and lead to local death, that this may be said to be the ordinary termination of the process. This process, in the phraseology of Virchow, is tuberculosis; while scrofulosis is used by him to signify the constitutional state in which tuberculosis occurs.

To pass from the general state to the particular local lesion.

Scrofulosis is that constitutional affection which commonly leads to tuberculosis.

Tuberculosis is that local process in the ordinary progress of which there occurs an exudation of a material, nutritive or pathological, which develops into cells that tubercularize or undergo the tuberculous metamorphosis.

Tuberculization is the local process by which the metamorphosis of the elements of a part into tubercle is effected—*i.e.*, endogenous development, atrophy, shrivelling, and desiccation of the cells.

A tubercle is formed of the detritus of the metamorphosed and atrophied cells, with the remains of the vessels, &c., of the part in which they were seated.

It requires some little attention to grasp fully Virchow's meaning; and to those who have been accustomed to use the word "tuberculosis" to denote a special constitutional affection, the employment of the term scrofulosis to express this state, and the restriction of the word tuberculosis to the local changes going on in a particular part, may be confusing; but a little consideration will prevent any misconception.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 184.

21.—ON TUBERCULOSIS.

By Henry Ancell, Esq., Lecturer on Materia Medica and Medical Jurisprudence in the School of Anatomy and Medicine adjoining St. George's Hospital, &c.

[First let us see what are the conclusions at which Mr. Ancell arrives after a consideration of the state of the blood.]

Mr. Ancell infers, from considering the analyses given by various chemists, Dr. Fricke, Andral, and Gavarret, and Dr. Glover, first, that the blood in tuberculosis is deficient in the proportion of red globules; second, that the albumen is augmented in quantity, but imperfectly developed and defective in quality; thirdly, that there is an excess of fibrine, but that this principle also is defective in its nature; fourthly, that the watery part of the blood is increased in proportion to the solid constituents; fifthly, that it is not ascertained whether the fatty principle is diminished; and in the sixth place, that nothing very satisfactory is ascertained as to the increase or diminution of the saline principles. A general view of the changes in all these elements and principles in tuberculosis, the author attempts to give in the following diagram.

- **Tuberculous Blood,** Defective in vital properties; the essential nature of the defect unknown.
  - Red Corpuscles. Deficient in number.
  - Deficient in structure.
    - Globulin *deficient.*
    - Haematin *deficient.*
    - Iron *deficient.*
  - Liquor Sanguinis. Vitiated in quality.
    - Water in *excess.*
    - Albumen; *in excess but defective in quality.*
    - Fibrine; *rather below than above the standard; defective in quality.*
    - Fats; *probably deficient.*
    - Colouring matters *modified.*
    - Alkaline salts *deficient.*
    - Earthly salts *deficient?*
    - Lime in *excess?*
  - White Corpuscles.

It thus appears that after great chemical research, much is doubtful and uncertain, if not positively in a state of confusion. Mr. Ancell nevertheless thinks, that the most general character of the blood in *tuberculosis* is diminished vitality, and that in reference to the diminished amount of the red globules, tuberculosis may be called a consumption of the blood. The blood, he thinks, possesses, in the healthy state, a certain degree and amount of vitality. This amount of vitality is denoted by its dynamic properties of endosmose and exosmose in the corpuscles, by its organic contractility, by its power of assimilating old and new matter to the form of the blood, by its power of forming red corpuscles and *liquor sanguinis,* the consumption of red corpuscles, and the waste of *liquor sanguinis* in nutrition. When the sum of these physiological actions, says Mr. Ancell, is within the physiological range, and they are in harmony with each other, a sufficient number of corpuscles being formed and wasted, and all the constituents of the *liquor sanguinis* being complete and proportionate, and renovated according to the requirements of the different tissues, the blood possesses the healthy degree of vitality. In tuberculosis, on the other hand, the sum of these actions is below the physiological range; moreover, the proportions of the constituents of the blood are subverted, and their qualities are deranged. This denotes a low degree of vitality, which is consistent with all the phenomena of the tuberculous predisposition, and with the signs of *tuberculosis* in its various forms.

Tuberculosis is a peculiar state of the blood, if not in the first instance, at least in a very early part of its history; and throughout, this condition of the blood not only continues, but in certain respects is increased, and becomes more intense. It is therefore not wonderful that analytical researches of chemists differ in their results; and that it is so difficult to obtain results which are harmonious and consistent. The blood is in a constant state of change and fluctuation, according to the variable state of those functions on which the state of the blood depends;

—the condition of digestion; of assimilation, primary and secondary; of respiration; of secretion; probably, as Dr. Holland suggests, of innervation. If digestion in the stomach and *duodenum* is imperfect and disordered, assimilation is imperfect and disturbed in consequence; and the chyle which is transmitted through the lacteals and veins is either imperfectly elaborated, or contains elements which it ought not to contain, or is destitute of elements which it ought to possess. If respiration be in fault, if the air breathed be bad from poisonous miasmata, we know from ample and undoubted experience that this acts in a most direct manner in deteriorating the qualities and condition of the circulating fluid. Looking at the inhabitants of miasmatic districts, and beholding their pale sallow faces and dingy-coloured skins, affords sufficient proof of the correctness of this inference. There may further be something in the action of the lungs, in the mode in which these organs act upon the air, that may modify and greatly influence the state of the respiratory function.

Further, if the various processes of secretion be feeble, inactive, and perverted; if articles which ought to be eliminated from the blood be retained in it, as the elements of bile, of urea. and probably other substances; it is easy to see that the blood so constituted cannot be in a healthy state. This is a frequent condition of disease in the blood in gout, rheumatic gout, chronic rheumatism, and several other morbid states connected with impaired and retarded digestion.

But, independent of all these sources of contamination and disease of the blood, it would appear that this fluid, under certain circumstances, loses of itself, as it were, its proper nutritious and reparative power. The blood evidently possesses a power of assimilating certain foreign substances,—all the organic products employed as articles of food. It is not ascertained whether it owes this power to some inherent property, or to the saline matters with which it is normally impregnated. All that is known is, that when the saline matters are deficient, disproportionate, excessive in one direction and defective in another, the blood loses its power of nutrition, or rather becomes unfit for nutrition, and disease follows;—paleness, feebleness, loss of flesh and strength; in short, an anæmious state. This condition the late Dr. Prout seemed disposed to attribute to the deficiency of saline ingredients, which he believed were requisite to the normal healthy constitution of the blood; and, in consequence of which being deficient, those actions and processes, probably electric, or electro-magnetic, for the requisite applications of the nutritious parts, did not take place. All this must of necessity be matter of conjecture; and, though it is not desirable to admit unknown causes of morbid conditions without sufficient proof, yet various facts seem to show, that of this there is as much probability as of many other morbid states.

One observation more only on this subject we make. There is too great a disposition in all instances to consider disease as a positive state; —as something having an active existence. To do so is quite natural; for it would be difficult to speak or to reason about it without doing so. At the same time it ought never to be forgotten, that disease is, correctly speaking, a negative condition. The positive condition is

health; the absence of this condition, the negative of it, is disease. So with regard to morbid states of the blood, and especially that called *tuberculosis*, they are not positive conditions. They are merely the absence of the healthy state of this fluid, whether this consist in the presence of morbid matters that ought to be rejected, or in the absence of healthy elements, the presence of which is requisite. The blood ceases, from various causes, to possess those principles and properties which fit it to act as a nutritious fluid. It accordingly does not nourish; and the organs and body at large are wasted, from not being supplied with materials to repair waste. It is true that the blood, besides losing certain principles and properties, possesses others which are not natural, —which are, in short, morbid. But it is to be remembered, again, that these morbid principles are not really new principles, but *degraded forms of original principles*. Even the analytical researches quoted by Mr. Ancell shew how slight is the change, how small and insignificant, apparently, is the deviation, in the most intense instances of tuberculosis. No element or principle is absolutely wanting. One is a little in excess, another is a little in deficiency; and these are all the tangible points on which the pathological inquirer can fix. Perversion, even in the proper sense of the term, it is impossible to detect. The blood is in some manner without those principles and qualities which enable it to be employed as a nutritious fluid; and this seems to be all that can be said, after much microscopical examination, and not a few chemical experiments.

[Mr. Ancell considers the following inferences are established from his investigations into the state of the blood in tuberculosis.]

"The debility of tuberculosis indicates a *direct* loss of power, and the whole of the phenomena of the predisposition and the symptoms of the disease shew,—

"1. That from the earliest invasion, the sum of the vital force is either below the standard of health, or it is relatively low as respects the structure and organisation of the individual.

"2. That this diminution in the sum of the vital force depends especially upon diminished vitality of the blood, and of the cellular, gelatinous, and muscular tissues produced and nourished from an imperfect blastema derived from the diseased blood.

"3. That, as tuberculosis advances, the sum of the vital force for the whole system continues to diminish; this loss of vital force being exhibited not only in the defective manifestation of voluntary and involuntary muscular power, but in the diminished resistance of the vital powers of the blood and of the cellular and muscular tissues to the change of matter in the animal body; hence, in tuberculous subjects, the rapid diminution of the red corpuscles of the blood, the deterioration of the vital qualities of the *liquor sanguinis* and of the blastema, the diminished plastic power of the cells, the low calorific power, and the emaciation.

"4. That frequently, but by no means universally, the nutritive powers of the blood, as respects the nervous tissue, remain undiminished, this tissue not requiring for its nutrition compound principles identical with it to be introduced into the blood with the food, and having a nutrition

peculiar to itself, differing from that of the cellular and muscular structures. Hence the diminution of vital force is not exhibited in the nervous system, but, as conductors of the force generated by the change of matter in the whole system, the nervous system remains intact. The particular condition of the vital force is, nevertheless, manifested through the nerves; hence activity and action without power, morbid irritability, &c. It is the highest manifestations of the vital force dependent upon nervous structure, as sensibility and mental phenomena, which so frequently remain unaffected during the physical degeneration. These phenomena are often rather augmented than diminished, the nervous matter, although perfect in structure, being more exposed from the waste of its cellular coverings; hence, frequently, increased sensibility to impressions in tuberculous subjects; and this occurring in the predisposed from the earliest age, and throughout a series of years, an acuteness of intellect is often exhibited.

"In estimating the symptoms of tuberculosis in a practical point of view, their absolute value, taken singly, is comparatively little, since one and all occur in other diseases. It is their relative value,—the association of several,—or the harmony of many in one case; the manner in which they arise,—and their mode of succession,—which distinguishes them from the symptoms of other diseases, and assists us in the differential diagnosis. Many of these symptoms are found associated in chlorosis, simple anæmic debility from venereal excesses, and other conditions of the economy. To those who have well considered the details of the tuberculous constitution, the difficulty of the diagnosis is considerably diminished. The symptoms, viewed in combination and relatively, rarely mislead, especially when they are decided in their development, constant, and progressive. In difficult cases our judgment may frequently be determined by a knowledge of the antecedent existence, or the absence of the predisposing and inducing causes,—as, for instance, of the hereditary taint, or a long-continued anti-hygienic regimen. In reference to the general disease, it has to be kept steadily in mind, that the diagnostic object is not to determine whether a local tuberculous development exists,—a tuberculosis pulmonalis or abdominalis,—but rather to determine *whether the patient is truly affected with the blood disease, and thereby threatened with its local manifestation.* The successful treatment of the disease of the blood in this stage, based on a knowledge of its nature and causes, is, in many instances, certain. The successful treatment of the disease after it has localised itself is frequently impossible.

"While I refer all the symptoms described to the tuberculous state of the blood on the one hand, there is frequently, as they present themselves in various groups, a direct relation subsisting between them and the pathological effects of tuberculosis to be described in another chapter. The defects of the osseous system, arising from perverted organisation and nutrition of the bones, are in direct relation to the scrofulous affections of the bones, which so frequently occur. The malnutrition of the lungs and thoracic parietes are in direct relation to the occurrence of disease of the lungs. The weak organisation and depraved digestive fluids of the alimentary canal, taken with bad diet and other anti-

hygienic influences are in direct relation to mesenteric phthisis. Again, as illustrating the relation of cause and effect in the ultimate result, where the subjects of tuberculosis are fed with unwholesome and insufficient diet, they present after death, more frequently than other tuberculous subjects, pathological lesions of the alimentary canal. Fournet states, that tuberculous subjects who had been fed on a sufficient and wholesome diet, scarcely ever experienced disturbances of digestion until towards the close of life, and after death he did not find a trace of intestinal tuberculization; while in those who, on the contrary, had been badly nourished for a long time, the dyspeptic symptoms were very prominent, and intestinal tuberculization was almost constant. I believe this statement to be somewhat too exclusive. But at the same time the complicated relations subsisting between—1, the effects of the blood disease and the local disease; 2, the effect of external agencies on the animal economy modified by the blood disease are undoubted; and when we consider them, it only enhances the necessity which exists of our improving the pathology of the general disease.

"The uniform association of structural and functional aberration in the tuberculous constitution is very striking. The remark made by Louis, that 'a function may be more or less seriously interrupted for a long time without the organ presenting any appreciable change of texture,' is undoubtedly true; but we must not overlook the qualification, —*appreciable*. This great pathologist evidently meant,—without any of those well-marked pathological results which usually enter into the *post-mortem* descriptions. A change of function always implies a modification of structure, and most especially so in a tuberculous subject. In such a subject debility, defective digestion, and depraved secretion, for instance, never occurs without implying a modification of structure in its nature tuberculous.

"Such, according to my view of tuberculous and scrofulous affections, is tuberculosis, as an essential disease of the blood, to which man, and the animals immediately beneath him in the zoological scale are subject more or less, at all periods of life, from early embryotic development to old age and decrepitude. Many will regard the disease thus described as an abstraction; and it must be admitted, thut, as it comes under the cognisance of the practitioner, it is rarely made the subject of his consideration and treatment until some local affection of a particular tissue or organ has proceeded so far as to complicate its symptoms, and still more rarely does it proceed to a fatal issue without some local affection having supervened. Nevertheless, throughout the progress of all the local diseases constituting varieties of tuberculosis, the symptoms and characteristics of the general affection may be recognised; it occasionally happens, that tuberculosis proceeds in the adult to the last stage of marasmus and a fatal issue without hæmoptysis, the aggregation of tubercle, or any obvious local affection. This is a more frequent occurrence in the early periods of life. It frequently appears also, that some local affection—as tubercles in the lungs—supervenes, but of so circumscribed an extent, that it interferes little with the functions of the organ, or the general symptoms of tuberculosis, or of the tuberculous predisposition, and from hygienic or other causes the general affection subsides,

and nature renders inert the local mischief by a cretaceous formation or a fibrinous deposit. Occasionally the local affection is too trivial to compromise life, and yet the patient goes on dying of the general disease. This frequently happens in children, and sometimes in adults, as proved by symptoms before death, and the existence of too circumscribed an organic affection, detected *post-mortem*, to account for the death; but the most frequent result is, that organic disease sets itself up, and complicates and very materially modifies and precipitates the symptoms, progress, and termination of the general affection.

"The essential condition of the blood, upon which the signs and symptoms of tuberculosis depend, is still a problem. In fatal cases, one or more organs, as the lungs, the brain, the mesentery, and the intestines, have generally become so far affected as to be incompatible with the continuance of life. In a future chapter the special pathology will be fully considered, and, to complete the history of the disease, the influence of the various organic affections over the original disease, and in the production of the usual fatal termination, ought to be estimated; but it may be here stated, that the diseased condition of the blood, the deterioration of the circulatory and more stationary fluids and solids, the emaciation, and the failure of vital force, are of themselves, in this general disease, totally apart from any special affection of an organ, fully adequate to produce such a result; and there can be no doubt that, in many instances, death is as much the consequence and the natural termination of the general disease as of disease of any vital organ."—*Edinburgh Med. and Surgical Journal, April* 1853, *p.* 416.

22.—ON PULMONARY CONSUMPTION.

By Dr. R. Payne Cotton, Assistant Physician to the Hospital for Consumption and Diseases of the Chest, &c.

[Tubercle is not the *cause* of the phthisis, but the *effect*. Phthisis is the constitutional state of the system, involving, as a consequence, the deposition of tubercle in some internal organs. Hence, in the first stage of phthisis, tubercle may not be present in the lungs, and the symptoms of consumption are not dependent on the quantity and condition of the deposit, but upon the degree of the constitutional malady, producing or altering this deposit. This seems proved by the fact, that the danger is sometimes more imminent when the tubercle has not softened, than when it has.]

According to Dr. Cotton, tubercular matter is formed in two modes; first by a gradual and uninflammatory process of separation from the blood; and secondly, by inflammatory action ending in a morbid scrofulous secretion instead of a healthy fibrinous one. The first is by far the most common, in short, the ordinary mode of the production of tubercle, as is seen in the large proportion of cases in which the disease makes its approach in an insidious and gradual manner; unattended at its commencement by any conspicuous thoracic symptoms. The second he thinks is comparatively rare, and is seen in those cases in which pneu-

monia, pleuro-pneumonia and bronchitis, either from neglect or by phthisical predisposition become obstinate and chronic, and finally pass into confirmed phthisis. That tubercle is not necessarily of inflammatory origin, he thinks, is shewn by the fact, that not only are the signs of pneumonia of rare occurrence during the early period of phthisis, but the pulmonary structure which surrounds tubercle of recent formation rarely presents any appearance of inflammation, the lung though more or less congested, being almost invariably crepitant and buoyant in water. He allows that, after tubercle has existed for some time, the parts immediately surrounding it are often hard and thickened; but this again, he argues, is the result of secondary inflammation, or of a process designed with a special object, to be afterwards explained.

Tubercles may remain in the miliary or granular form, in which they are first deposited, for almost any length of time, according to Dr. Cotton,—even during a long life. But more generally, within a limited space of time, they increase in number, and are converted into a yellow, or yellowish-white, homogeneous, dull, cheesy-looking material, known by the name of crude tubercle. This is ultimately transformed into calcareous matter, or it is broken up into a soft purulent or flaky substance, intermixed with fluid.

The calcareous matter, he thinks, arises either from the simple absorption of the animal matter which had existed in the tubercle, while the earthy constituents continue, or it depends upon a process identical with ordinary petrifaction, in which each organic molecule, as it is removed, is exactly replaced by a calcareous one; so that the chalky substance ultimately acquires the exact form of the original tubercle. Carbonate, with a small proportion of phosphate of lime, a salt of soda, and animal matter, constituted all the specimens examined by Dr. Cotton; but he allows that their chemical characters may vary.

When the deposition of tubercular matter originates in an inflammatory attack, the course is different, and much more rapid. The stage of grey granulation is then very short, or entirely wanting; the product of inflammation is from the first of a low kind, allied to, if not identical with, crude tubercle, or rapidly becomes so; and the calcareous transformation seldom if ever takes place.

Dr. Cotton gives the following description, as we understand, from personal observation.

Miliary tubercle from the lungs consists of a dense mass of imperfect cell-nuclei and ruptured cells, thickly studded with granules, through which are distributed a few oil globules, elongated fibres, and black matter identical with the ordinary carbonaceous matter common in the lungs. In these materials Dr. Cotton never observed tubercle, after examining in many different cases, to be deficient. But they are associated in variable proportions, according to the amount of vitality in the tubercular mass,—that is, according to the degree of phthisis by which they are produced. The closer the tubercle approaches to living structures, the more numerous and perfect will be its cells. The cells themselves are generally so broken down and irregular, that they can scarcely be said to have any definite shape. But when sufficiently perfect to be examined, they are of various sizes, irregular in shape, and void of

nuclei. The fibres do not interlace, but are irregularly scattered, and appear to be derived from the surrounding tissues rather than as an essential constituent of the tubercular mass.

The proper definition of tubercle would be, according to Dr. Cotton, that it is a mass of dead and dying cells and abortive cytoblasts—an attempt at reproduction ending in the formation of a cell-mass, of different degrees of vitality in different cases, and sometimes also of different structure in different organs, but incapable of long resisting the chemical and physical changes to which unorganized bodies are liable.

It is impossible to avoid remarking that here there is a little inconsistency. Tubercles are allowed, by most pathologists to be unorganized bodies; yet here are assigned to them degrees of vitality. It appears to us that it would not be difficult to shew that they possess no vitality whatever. A substance may be the product of vital action, which, however, possesses no vital power or property itself.

As tubercle advances in its stages of transition, the minute structure becomes modified. The yellow or crude tubercle is composed of granular matter, and an increased number of oil-globules, with which may be interspersed a few remains of cell-growth in the shape of broken cell-walls and cytoblasts.

Softened tubercle is merely an intensely granular mass intermixed with oil-globules; and its dark granular appearance may be detected in examining more especially the sputa of consumptive patients.

The conversion of miliary into yellow tubercle, and the process of tubercular softening is effected,—according to Dr. Cotton,—chiefly by the conversion of albuminous into oily matters, or by fatty degeneration. —*Edinburgh Med. and Surg. Journal, April,* 1853, *p.* 412.

23.—ON THE CAUSE OF TUBERCULOSIS, WITH SUGGESTIONS AS TO ITS PREVENTION.

By Dr. J. G. Atkinson, Physician to the Wakefield Dispensary.

[Dr. Atkinson has had the opportunity of making extensive observations upon the subject of tuberculosis. Every man who has died of this disease during the last five years at the Wakefield convict prison, having been narrowly watched by him during life, and the post-mortem examination witnessed by him when dead. He says,]

From the experiments instituted by Simon, it appears that during respiration the oxygen of the atmosphere combines with the blood-corpuscles, and that the consumption of oxygen and formation of carbonic acid stand in a direct ratio with the amount of these blood-corpuscles, and with the number of respirations in a given period; hence it is obvious that the oxygen of the atmosphere is consumed in the metamorphosis of the corpuscles. And it would further appear that the amount of fibrine always varies inversely with the mass of the blood-corpuscles, or, in other words, that the more corpuscles there are, the less in quantity is the fibrine—and *vice versâ.*

It appears most probable that as the blood-corpuscles principally con-

sume oxygen during their change, it is by this process that the fibrine is produced; and that wherever an extraordinary consumption of corpuscles takes place, the quantity of fibrine in the plasma also increases. If by any means the circulation be quickened, or, in other words, the mutual action between the blood and oxygen be increased, more blood corpuscles will be consumed in a given time.

Although the temperature of the body is nearly the same in all parts, in consequence of the metamorphosis of the tissues constantly going on, yet the temperature of the lungs is slightly higher than that of the other parts of the system, which may be accounted for by the more energetic action of the oxygen on the mass of blood in these organs, than in other parts of the body.

Now Andral and Gavarret observe that, in all stages of phthisis, analysis of the blood shows that the fibrine is always on the increase, and the corpuscles on the decrease; but that this increase and decrease vary proportionately with the progress of the disease. Liebig states that it must be received as an undeniable truth, that all the organic nitrogenized constituents of the body are derived from protein, when we reflect on the development of the young animal in the egg of a fowl, where, out of the albumen, feathers, claws, globules of blood, fibrine, membranes and cellular tissue, arteries and veins, are produced. Now this albumen contains, for the quantity of nitrogen present, exactly the proportion of carbon required for the formation of these tissues!

Let us, for one moment, look into the nature of tubercle. Chemistry has thrown little light on its mode of formation. Simon states that it might be regarded as protein from which a portion of carbon and oxygen have been removed; or, to speak precisely, it may be supposed to be derived from protein, which substance has lost, during the transformation, three atoms of carbon, and one of oxygen. The formula is—

	C.	H.	N.	O.
Tubercle	43	35	6	13
Protein	48	36	6	14

From the observations previously made, viz., that the more corpuscles there are, the less in quantity is the fibrine; and from the experiments of Andral and Gavarret, that the blood in phthisis contains more fibrine and less corpuscles; and, moreover, recollecting that the temperature is somewhat greater in the chest than in other parts of the system, probably because a more energetic action of oxygen takes place in these organs,—it would appear fair to conclude from these facts, that in phthisis the combination of oxygen and carbon, in the lungs especially, is more active than in the normal state. Now we will say one word concerning the *remedies* employed and found most beneficial in this disease. They, for the most part, may be arranged under two heads, first—general tonics; secondly, those compounds which contain large proportions of carbon, such as cod-liver oil, naptha, &c., &c. It cannot be doubted that the remedial efficacy of the latter class mainly consists in their readily giving up their carbon, and we have shown a great want of this element in the tubercular deposit. We may also add, that in this disease all the adipose tissues of the body are almost become emptied.

In one case of phthisis, where the blood had been analyzed in a patient

who had taken cod-liver oil, it was found that the fat, when isolated, smelt strongly of the volatile fatty acid of the cod liver oil; and, moreover, that the solid constituents of the blood were observed to be of a very large amount.

So far so good—both theory and practice agree; but it appears to me, that no cure can be expected from such a class of agents. They no doubt preserve the body from being so rapidly burnt up, but this is all we can possibly expect them to do. We do not get at the root of the evil, or at what is the primary cause of the tubercular deposit. Now, if tubercle be protein, with a deficiency of carbon, there appears to be some reason for supposing, that in this peculiar diathesis the elements of the organism do not adhere together with that degree of tenacity which constitutes normal health. Liebig says there is nothing to prevent us from considering the vital force as a peculiar property, which is possessed by certain natural bodies, and that this force is continually being opposed in the organism by a chemical force; and by the action of this chemical force, a separation of part of the body, in the form of lifeless compounds, begins; and if, from any cause whatever, the resistance of the vital force diminishes in a living part, the change of matter increases in an equal degree. In the vegetable kingdom the resistance of the vital force is sometimes shown very powerfully, when we perceive leaves charged with turpentine or tannic acid resisting the affinity of oxygen for these compounds. On the other hand, when this force is lessened in the organism, we need not be surprised at great abnormal changes necessarily occurring. Again, the same author observes that the absorption of oxygen occurs only when the vital force of living parts is weaker than the chemical action, and that animal life may be viewed as determined by the mutual action of opposed forces; that the increase of the body is effected by the vital force, and the waste of the body by the chemical action of oxygen; and that the condition of the body which is called health, results from an equilibrium among all causes of waste and of supply. Now, I think we have evidence, that, in this peculiar condition, the carbon of the body is too easily acted upon by the atmospheric oxygen, and therefore, that the balancing operation which takes place in the transformation of protein into carbonic acid, urea, water, &c., which constitutes health, is so far overturned, that a larger quantity of carbon is removed in proportion to the amount of nitrogen and hydrogen, which, in the healthy functions, are carried away by the kidneys, liver, skin, &c.; hence, these latter elements, not being taken away by their proper emunctories, combine in certain definite proportions, and constitute the deposit known by the term tubercle.

In seeking, therefore, to discover a remedy for this disease, our object ought to be to ascertain whether there are any agents, dietetic or medical, which could prevent this too quick transformation. In making this enquiry, we must first observe, there can be no question that the victims of this disease are chiefly taken from amongst that class of individuals whose general tone of system is lowered, as occurs among the pampered and over-protected children of fortune, or in those living in confined end unhealthy atmospheres, &c., &c. A remarkable fact exists, strange as it may appear, that in consumptive families the most dissipated and

irregular in their habits, and those who have habitually exposed themselves to many of the causes liable to engender this diathesis, have yet frequently enjoyed longevity; whereas, in the same families, the most virtuous, and those who have guarded their lives with the greatest care and prudence, have fallen early victims. Hence, it is an interesting matter to ascertain how far alcoholic drinks, in this disease, preserve those constitutionally predisposed from these direful results. I think it is agreed, that alcohol, like all other highly carbonized substances, does supply a certain amount of pabulum for the blood. Now, does it act in any other way? Does it at all prevent that disposition to oxidation on the part of the organism of which we have spoken, and thus by making the protein compounds less ready to combine with oxygen, render them less likely to be easily broken up? That it has this property out of the body is very evident, and may it not have an equal power when taken internally? There can be little doubt that alcohol is taken up and circulated in the system, primarily, as alcohol, yet its elements ultimately become separated—its carbon and hydrogen are given off as carbonic acid and water; for Liebig could not detect, either in the expired air, or in the perspiration, or in the urine, any trace of alcohol after indulgence in spirituous liquors. By the use, therefore, of alcohol, a limit must be put to the change of matter, in certain parts of the body; for the oxygen of the arterial blood, which, in the absence of alcohol, would have combined with the matter of the tissues, now combines with the elements of the alcohol—the arterial blood becomes venous, without the substance of the muscles, &c., having taken any share in the transformation. Thus, we perceive, without the manifestation of a corresponding amount of mechanical force, the heat of the body increases after the use of wine. We have here some explanation offered to account for the dark, venous, bloated countenance of the man who lives freely; and we may contrast it with the florid, arterial hue, so characteristic of the countenance of the phthisical patient. In the former case, we have the system surcharged with carbon—in the latter, the arterial blood becomes too highly oxidated. Is it not then fair to conclude that alcohol acts, in the first place, by preventing quick oxidation of the tissues, and then becoming decomposed, it supplies carbon? And if this be so, would it be attempting to carry out a principle too far supposing that the peculiar acuteness, if not vigour of intellect, which is so strongly observable in the phthisical patient, might depend upon hyper-oxygenation of the blood circulating in the brain?—just as we know a temporary exhilaration of the spirits seems to be caused by the inhalation of oxygen gas. On the other hand, it is equally well known that a sluggishness, both of mind and body, is a necessary attendant on the beer-drinker, which most probably may be accounted for by the too carbonized state of his blood. It has been found in prisons that men are admitted, apparently in good health, and remain so for some months; that they then become dyspeptic, fall off in health, and die of tubercular consumption, running through all its stages in a few months, and even, in some cases, in a few weeks. And I believe I am not wrong in stating that four-fifths of the deaths in prisons are the result of tubercular disease.*

* Mr. Milner, Surgeon to the Wakefield Convict Prison, authorized the above observation.

It may be observed that, as regards diet, cleanliness, regular habits, and an equalized temperature, the greater part of them were infinitely better off than before conviction. The only cause likely to be detrimental to health, would be the effect produced upon the mind by restricted liberty and prison discipline. Now, I may state, that with scarcely a single exception, these men have been throughout life more or less drinkers. The prison fare, however, does not permit the smallest allowance of alcoholic stimulus, unless specially ordered by the medical officer. Here it will be interesting to inquire, whether the loss of this agent has anything to do in producing the tubercular diathesis? I might also state as a remarkable circumstance, that at the *post mortem* examinations of the convicts during the last five years which I have attended, every body examined, no matter how death had occurred, had tubercular deposits, in one or more organs, with the exception of one man who died of epilepsy. Again, no class of men, on an average, take more stimulants than innkeepers, or the old-fashioned but now almost obsolete coachman. To this number I might add butchers, who, besides consuming large quantities of animal food, generally also drink freely; as well as men employed at breweries. Whether statistical evidence may prove or disprove the fact, I am strongly inclined to believe, from a recollection of cases, as well as from their general appearance, which is familiar to all people, that they are not liable, but rather the reverse, to tubercular diseases. If the inference be correct from these and other similar illustrations which might be quoted, it would appear that alcohol, although most injurious and destructive by producing multitudinous diseases, yet may it not in this instance act as a kind of preservative, by protecting the organism from the action of oxygen, which we believe we have shown to be the immediate cause of the deposition of tubercle? If this be so, could not some chemical agent be discovered, which would have a protecting, but not otherwise destructive, agency? For instance —I merely propose it as a theoretical suggestion—would tannic acid, combined with some highly carbonized substance, and a moderate supply of alcoholic beverage, or some such compound, have this protecting influence? I think it likely that if any such agent be ever discovered, it will be found amongst that class which have a like preservative property when used extrinsically to the body.

In Hasse's work, edited by Dr. Swaine, it is stated, "for the most part this disease is traceable to a catarrh, which, after a first attack, leaves perhaps but a slight cough behind, but, on frequent repetition, gradually and irretrievably lapses into confirmed phthisis; or the disease, almost equally often, sets in with hæmoptysis." If the author means by this the commencement of the disease, I cannot agree with him. I regard these symptoms as quite of a secondary nature. Although I am well aware that tubercular disease of the lungs has been considered the result of inflammation, yet I am disposed to believe that this is erroneous, and that tubercle is deposited in consequence of a peculiar state of the system, in which the transformation of the tissues has not been carried on in perfect equilibrium; and that when deposited, the tubercle may, and often does, remain for a longer or shorter period, without creating much local inconvenience or disturbance. This will, however,

greatly depend on the amount deposited, and on its rapidity, as well as on other collateral circumstances; and the catarrh, inflammation of the lung, pleurisy, hæmoptysis, &c., are entirely dependent on the mechanical irritation caused by the presence of tubercle. I am strongly of opinion that the deposition of tubercle may be much more general than is usually believed, not necessarily shortening life, or perhaps inducing ill-health; but I think it both possible, and very probable, that whenever the vital tonicity is sufficiently lowered, this deposit might take place in any organ. Dr. Carswell thinks it possible that tubercle may be re-absorbed; and, if deposited on the mucous membrane of the air passages, or of the bowels, I cannot see why it may not be thrown off and ejected, as any other foreign matter.

Dr. Addison, having examined, with a lens, many apparently healthy lungs, absolutely found tubercles deposited more or less abundantly in one-third. From a perusal of Laennec's work, it seems evident that, although he had by no means satisfied himself as to the mechanism of the formation of tubercle, yet there appears little doubt he regarded it as a deposit taking place from some unknown cause, and he appeared strongly averse to the opinion that it was the result of inflammation. M. Louis alleges, that, with one single exception, he never found tubercles in any other organ without their existing in the lungs at the same time, insomuch that he seems positively to consider their presence in the lungs as essential to their development in other parts. I am disposed to believe that tubercle may be deposited in any part where metamorphosis of tissue occurs; yet I think it more likely to happen in the lungs, in consequence of a more full and energetic action of oxygen taking place there, than in any other parts of the organism. Hasse says that, in that acute form of tubercular phthisis which often proves fatal in the third week, the vital symptoms are very peculiar, bearing so close a resemblance to those of typhus fever, as to lead to mistakes, and the diagnosis can only be ascertained by the stethoscopic sounds? In corroboration of these views, I examined a man at the Convict Prison, who had been ill a few days, and diagnosed the case typhus. He lived about a fortnight, and on a post-mortem examination, the whole of both lungs were completely studded with tubercles, which had not yet formed communications with the bronchi, and tubercular deposits were found also in the abdomen and head. The late Dr. John Taylor, of University College Hospital, informed Mr. Milner that he had seen two similar cases, and that in both the disease at its commencement had been considered to be typhus. Now I regard these cases as the result of a very marked deficiency of the vital force. Hence, during a very short period, the protein compounds were so rapidly acted upon by the atmospheric oxygen, that the disease began and finished in the course of a few weeks—indeed, the rapidity and extent of the tubercular deposit are so great, that patients absolutely die before the disease has extended further than simple deposition. As some proof of the views I entertain, I will relate one or two instances which have occurred immediately under my own eye; but as many of the individuals spoken of are at present now living, I cannot, of course, furnish names.

1st.—A family consisting of five sons and one daughter; all appeared

to enjoy good health up to about eighteen. Out of this family, three sons died between the ages of eighteen and twenty-five, of phthisis; the daughter is still living, although in very precarious health, evidently phthisical. All these were steady, industrious, and peculiarly careful of their health. The two remaining sons, now between thirty and forty years of age, when last heard of were quite healthy. Early in life, these two latter men were of dissipated habits, and lost many situations in consequence of their propensity to drink. One of them, at the early age of nineteen, came over from India with an inflamed liver and dropsy, from spirit drinking, he was many months ill, but ultimately recovered. When last seen they were in robust health, but had bloated countenances.

2nd.—A family consisting of three sons and three daughters. They all had the characters of the scrofulous diathesis strongly marked—fair hair, clear complexion, blue eyes, thick lips, &c. The three daughters died of phthisis before the age of thirty; one son of tubercles of the brain—the two remaining sons are still alive, of irregular habits, but in apparently good health.

3rd.—A young man at the age of eighteen showed every symptom of approaching tuberculosis; he had already lost one brother and sister by phthisis. His medical man advised him to relinquish a profession of a sedentary nature, in consequence of the above facts. He did so, but unfortunately became dissipated. He is now alive, about forty years of age, a confirmed drunkard, and has suffered several times from delirium tremens.

We gather, therefore, from the foregoing observations, that tubercular deposits are eminently dependent, as the primary if not the sole cause on a diminution of the vital force.—2ndly. That in phthisis the body is rapidly consumed by the combination of its elements with oxygen.—3rdly. That the consumption of the body may be retarded by the ingestion of certain highly carbonized substances, as cod-liver oil, &c.—4thly. That it is probable the rapid oxidation of the body may be checked, or entirely prevented, by the use of alcohol, or of some agent acting in the same way.*—*Lancet, December* 4, 1852, *p.* 515.

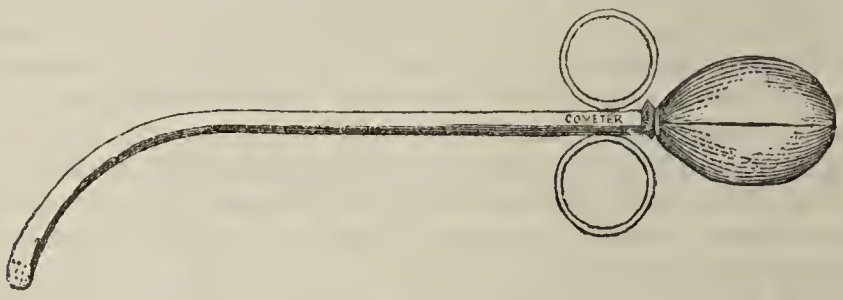
24.—ON THE APPLICATION OF NITRATE OF SILVER TO THE FAUCES AND LARYNX.

[A variety of methods have been adopted to apply nitrate of silver, either solid or in solution, to the fauces and larynx. We subjoin a description of an instrument made by Mr. Coxeter. But we confess that we should prefer the old method of a bit of sponge tied to the end of a bit of whalebone. We have seen and described several methods of applying the solution to the larynx; but we would warn the practitioner to be very cautious how he adopts this method, for fear of suffocation. There is

[* The reader will find some very interesting remarks on Tubercular disease in Mr. Simon's lectures on Pathology, some of which we have abstracted in former volumes. Mr. Simon especially confirms the statement here made by Dr. Atkinson, that the more *venous* the blood, the less disposed to tuberculosis: and the more oxidized it is the more disposed to deposit tubercular matter.]

no doubt, however, that if nitrate of silver could be safely and easily applied to the laryngeal and bronchial surfaces, it would have a wonderfully beneficial action, as it has upon all mucous surfaces.]

Mr. Coxeter's Laryngeal Shower Syringe is by far the most convenient form in which a syringe can be used for these applications to the interior of the the throat and the posterior nares. It consists, as seen in the sketch, of a seamless tube, composed of silver—not unlike that of a medium-sized catheter. It is curved in a form suitable to its intended



uses. The distal extremity is somewhat flattened from side to side, and is perforated by fine openings, which admit of the emission of the contained fluid in the form of a delicate shower. The proximal extremity is fitted with an elastic suction-bottle, which, by its own action, charges the instrument with the fluid, which is then emitted by simply compressing the bottle with the thumb. Rings are attached for holding the little instrument, and an ingenious arrangement is made, by which the quantity of fluid ejected can be accurately regulated. The inventor says that his shower syringe possesses the advantage of applying gently, and without friction, to an irritable surface, the remedial agent intended to be employed. It does this more generally and uniformly than the sponge, and is entirely free from the risk to which the latter, in becoming detached from the whalebone, is liable. Our experience in the use of the instrument entirely corresponds with this favourable report of its inventor.—*Lancet, Jan.* 22, 1853, *p.* 85.

25.—AFFECTIONS OF THE BRONCHIAL MUCOUS MEMBRANE IN CHRONIC RENAL DISEASE.

By Dr. George Burrows, F.R.S., and Dr. W. Senhouse Kirkes.

In the course of chronic disease of the kidneys, the several great mucous and serous membranes are exceedingly prone to become seriously affected. The affection of the mucous membranes is manifested in various disturbances of their ordinary functions, and occasionally in an inflammatory process of a more or less severe and protracted kind, attended usually with a copious discharge from their surface. The affection of the serous membranes consists chiefly in the accumulation of fluid within their cavity, and occasionally in a low but often fatal inflammatory process. There seems to be sufficient reason for believing that the affections of the mucous and serous membranes, as well as many

other secondary complications occurring in the course of chronic renal disease are due, in a great measure, to the disordered state of the blood which the structural affection of the kidneys engenders; for in nearly all confirmed cases of renal disease the respiratory and gastro-intestinal mucous membranes present signs of being more or less disordered, and the tendency to effusions and inflammations within the different serous cavities is more or less strikingly manifested. The affection of the respiratory mucous membrane is shown in the almost habitual catarrh to which the victims of renal disease are subject; that of the alimentary mucous membrane in the nausea, vomiting, and disordered bowels so common in this disease; and when the disorder of either of these great mucous membranes runs on to inflammation, the profuse discharge which in such case often takes place from the affected surface may with reason be considered to result from a natural effort to remove in this way from the system certain injurious materials which, in consequence of the disease of a great excreting organ, have accumulated within the blood. For, although the mere process of discharge may be productive of serious distress and debility, yet it not unfrequently happens that, after such free secretion from a mucous surface, the dropsical effusion which previously existed becomes greatly diminished, and various cerebral and other symptoms, indicative of the circulation of urea in the blood, subside or are removed. And it seems likely enough that the relief in such cases is due to the elimination of some of the morbid materials of the blood along the mucous surface from which the free discharge has taken place. The probable correctness of such an opinion is supported by the almost constant disorder of the gastro-intestinal mucous membrane, manifested in nausea, and vomiting, and profuse diarrhœa, which ensues when, from accident or experiment, any noxious organic materials are received into the blood. Examples of this occur after the absorption of foul gases, or the injection of putrid matters into the blood-vessels of animals, also in puerperal fever with uterine phlebitis, and in the typhoid or extreme hectic condition when gangrene is going on. That the affection of the mucous surfaces in chronic renal disease is dependent on the permanently-abiding disorder of the blood, and not on a mere temporary or accidental cause occurring in the course of the disease, is made probable, too, by the very obstinate and protracted nature of the mucous affection, by its liability to relapse independent of ordinary exciting causes, and by its frequent persistence in a chronic form long after the violence of its first attack has been subdued. Chronic catarrh and chronic diarrhœa, with occasional vomiting, are noted among the most common and troublesome of the secondary affections of renal disease, and their obstinacy and intractableness are probably in a great measure due to the fact, that the cause which gave rise to them is of a permanent and not a transitory kind, and dependent on a general morbid condition of the blood, and not on any circumstance acting only locally and temporarily on the affected membrane.

The constant discharges which in some cases take place from the bronchial and intestinal mucous surfaces, do not usually leave any structural changes discoverable in these membranes after death, but occasionally there is distinct evidence of ulceration of the intestinal mucous mem-

brane, usually of a dysenteric kind, and affecting the large intestine. It may admit of question whether the dysenteric ulceration in such cases is a mere accidental complication, independent of the primary disease of the kidneys, or, as seems more probable, results from the direct irritation of an unusual and probably acrid secretion continually eliminated from the affected surface.

It is not common for both of the great mucous membranes to be simultaneously affected to any considerable extent in renal disease; for although each of them is usually somewhat disordered, yet, generally speaking, the principal mischief is limited to one, and rarely leaves it to attack the other. Thus, when the brunt of the affection falls upon the bronchial mucous membrane, it is unusual for it to leave this surface and attack that of the alimentary canal; and the same persistence of the affection in the membrane first attacked is observed when the alimentary mucous tract is the main seat of the secondary affection. When either mucous membrane is seriously affected, and free discharge takes place from its surface, it usually happens that the tendency of the disease to kill by dropsy or cerebral disorder is kept in abeyance, though death not unfrequently arrives in consequence of the prolonged distress and exhaustion resulting from the perpetual drain from the affected mucous surface and the attendant disorder of its own proper function as a respiratory or alimentary organ. It may be observed, too, that affections of the mucous membranes, especially of the respiratory tract, are not limited to any particular stage of the disease, being as common in a first attack of febrile dropsy, or dropsy after scarlet fever, as when the disease is thoroughly confirmed, or advanced to its last stages.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 8.

26.—*On the Local Application of Cod Liver Oil.—Ol. Morrhuæ.*—In Sweden cod-liver oil has for some time been employed as an external application in the treatment of cutaneous maladies, and from that country it has recently been introduced into English practice. We have had frequent opportunities of watching its effects as prescribed by Mr. Paget, in the out-patient's room of St. Bartholomew's Hospital. The class of cases for which it appears most applicable, is that of chronic eczematous eruptions, unattended by acute inflammation of the skin or general pyrexia. In abating the troublesome itching which frequently accompanies this disease, especially in old people, it has manifested powers decidedly superior to those of any other application with which we are acquainted. In the majority of instances it can, of course, only be expected to assist constitutional treatment, not to supersede it.

We have as yet had no opportunity of forming an opinion respecting the proposed inunction of the oil in cases of phthisis, where the stomach cannot take it. Whilst on this subject, however, we feel inclined to strongly recommend the practice of exhibiting it *simultaneously with tonics*, as iron, quinine, &c., which is now adopted with great success at several hospitals. The digestion and assimilation of the oil appears to be much aided by such combination. In the treatment of cutaneous

struma and lupus at the Hospital for Skin Diseases, it is usual to administer along with the oil small doses of mercurials, which are often continued for many months. The success attending this practice is very great, and appears to much exceed that which results from the administration of either drug alone.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 23.

27.—ON THE USE OF TRACHEOTOMY IN CROUP.

By Henry Smith, Esq., Surgeon to the Westminster General Dispensary, &c.

[Is tracheotomy of any effect in the inflammatory exudations of the air passages in young children? Eminent medical men differ in opinion, and the question is still an open one. In France it is much more successful than in England. This is accounted for, by the disease in that country being rather different in its nature, (in France it is generally seated high up in the windpipe), and by the earlier performance of the operation. In three cases in which Mr. Smith has performed the operation in croup occurring in children, no benefit was in any of the cases derived from it. In the first case, the patient was a little boy two years old. All the violent symptoms of croup were present, but had manifested themselves within thirty-six hours. As the usual remedies had failed to procure relief, tracheotomy was proposed.]

The patient was accordingly placed upon a table, in a good light, its head was supported by a pillow, and its neck extended. I made an incision over the lower portion of the trachea, a little more than an inch in length, quite in the median line. As I cut through the skin and cellular tissue, fortunately very cautiously and slowly, a vein as large as a crow-quill, and distended to the utmost, rolled away from the point of the knife. This being avoided, the knife was carried deeper down between the muscles, until the fascia covering the trachea was exposed. Close upon the tube was another large vein. I was, therefore, obliged to use the knife with the utmost caution, whilst Mr. Tinney held the parts asunder with two blunt hooks. Some three or four minutes were thus consumed, but fortunately there were not more than a few drops of blood lost. However, just as the trachea was being exposed, the child suddenly gasped, fell back, and its breathing and heart ceased their functions. Without further delay the point of the knife was dashed into the trachea, and, at the same time, Mr. Tinney vigorously inflated the lungs by the child's mouth, and after a minute of great anxiety on our part, we saw the act of respiration feebly attempted. The process of artificial inflation was then repeated and carried on for half an hour. By this time the heart had begun to beat perceptibly, and the breathing was resumed with comparative frequency, and at the termination of an hour the child became perfectly sensible, and took some brandy. By this time we had managed, with great difficulty, to introduce a silver tube into the trachea; but as this did not suit well, I substituted a portion of gum-elastic catheter, which served admirably the purpose intended. This was tied

in, and the child well wrapped up, placed near a good fire, and wine and beef-tea were given every now and then in small quantities.

At 3 p.m., to my great astonishment, the little thing was doing admirably; it was apparently free from distress, and breathing with ease; its face was of a natural colour, the pulse good, and the surface warm. Strict orders were left with the nurse to clear the tube if it became obstructed by mucus.

At 6 p.m., Mr. Tinney saw the child, and reported that he was still going on most satisfactorily. At 8 p.m., this gentleman was suddenly summoned, and found the child, on his arrival, dead. It appears that up to this period he had been apparently doing well, when suddenly he became distressed, turned his head from side to side, and then ceased to breathe.

On *post-mortem* examination we found that the whole of the trachea was lined with a thin film of false membrane loosely adherent to the tube. It reached as far as the bifurcation, but did not extend into the bronchi. The lungs were healthy, with the exception of some congestion at their posterior and lower portions, and there was a considerable amount of mucus seen when they were cut across. The larynx was free from disease. The opening in the trachea was just below the isthmus of the thyroid gland.

The next case was detailed at length in the 'Medical Times and Gazette' of last year, as it presented a feature of special interest, from the circumstance of its having been the first instance in which chloroform was given during the operation of tracheotomy. It is necessary for me to give the particulars again.

Case 2.—I was requested by Mr. Welsh, of Blackmoor-street, at 2 p.m., on August 12, to perform tracheotomy upon a little girl, aged 4, who was suffering severely from croup. It appeared that the child had been taken with the premonitory symptoms more than a week before; and that four days previous to my seeing her, decided signs of croup set in. Various remedies were used, but the child became worse, and when I saw it, was apparently in danger of speedy dissolution. There was excessive difficulty in breathing; there was hardly any expansion of the chest, but great labouring with the extraordinary muscles of respiration; and a very feeble pulse. I had the good fortune to be accompanied by Dr. Snow, and by that excellent surgeon Mr. Wiblin, of Southampton, who agreed in the propriety of the operation. Dr. Snow also consented to try chloroform. Accordingly the little girl was carefully put under its influence, when the breathing became more tranquil, and I proceeded to perform the operation. This affair happened to be most tedious, for I very speedily cut through a large vein at the root of the neck, which bled profusely. However it was effectually controlled, and I opened the trachea, and introduced a piece of gum-elastic catheter. It was necessary to be very cautious in preventing the child from suffocating, as immense quantities of mucus were ejected by the wound. Great irritation continued for about half an hour, but during this time the wound was kept well open by two blunt hooks; and in one of the violent fits of coughing, a long portion of false membrane was partly ejected by the wound. This was drawn out by the forceps and removed; after this, the

irritation ceased in a great measure, and the child was able to take some wine-and-water.

Two hours after the operation, she was breathing with tranquillity, and had taken nourishment. There were, however, at intervals, some severe paroxysms of cough, accompanied with ejection of quantities of mucus, which came through the tube. Two minims of liq. opii. sed. were ordered to be given to the child the last thing at night. Small quantities of beef-tea and wine were exhibited.

August 13, 10 a.m.—The child has passed a very fair night, and now breathes with tranquillity; the air passes very freely through the tube, and the chest expands well. There is, however, a great deal of inflammatory œdema of the neck in the region of the wound. There is very little cough and irritation. She takes nourishment well.

8 p.m.—The child has been lying in a partial state of stupor during the whole day, but has not been distressed in its breathing. This evening, symptoms of sinking are manifest; the pulse is quicker and more feeble, and there is a difficulty in getting the patient to take nourishment. From this time she got gradually worse, and died at 2 a.m. on the 14th, thirty-six hours after the operation.

On *post-mortem* examination, I found the following appearances:—The inner surface of the epiglottis and larynx was studded with a white filmy deposit, while the trachea was lined in its entire length by a thick false membrane, and this croupy deposit was found to descend into the bronchi, even into the lower ramifications of the same. The lower and posterior portions of the lungs, especially on the right side, were a great deal congested, but their superior and anterior portions were in a pretty healthy condition. On peeling the false membrane from off the trachea, its inner surface was found to be in a very inflamed state. The brain was remarkably firm, and there was not any great congestion or any fluid in the ventricles. I had made the incision quite in the central line, but the knife had cut through the isthmus of the thyroid gland.

Case 3.—I was requested by Mr. Collins, of Mornington-place, Hampstead-road, at eleven a.m., Dec. 28, 1848, to open the windpipe of a little patient of his, aged eleven months. On visiting the case I found the child apparently dying from impaired respiration; this function was carried on with extreme difficulty; the alæ nasi were hard at work; the face was livid, and the inspiratory efforts were accompanied with a peculiar shrill noise, not precisely the noise of true croup. The child had been attacked with measles some three weeks previously, and had been progressing favourably until the 25th of December, when symptoms of inflammation about the upper part of the windpipe came on. On the 27th dyspnœa became marked, and on that evening the peculiar sound before spoken of was first heard; it was more like that of a railway whistle than anything else. Mr. Collins adopted the ordinary remedies for such symptoms, but they increased with rapidity, and on the morning of the 28th, threatened to be fatal. That gentleman strongly expressed his opinion that the disease was seated in the larynx principally, and for this reason he thought that tracheotomy might save the child's life. I acceded to his wish, and having placed the child on a table, its head and shoulders propped by a pillow, I made an incision about one

inch and a half in extent, in the median line of the lower portion of the neck. On getting down to the trachea, and as I was cutting through the fascia which covered it, I laid open a vein, which bled very freely, and rendered the last steps of the proceeding most troublesome. However, I opened the windpipe, and with great care prevented any blood getting into it. A piece of gum elastic catheter was introduced and fixed in; some wine and water was given. The breathing at once became more free; the eyes and face of the little child became remarkably changed for the better, and the pulse rose in volume. I stayed with it some time, when finding the improvement continue, I left, after having given small quantities of beef-tea and wine, and ordered an enema of the same to be exhibited.

At 3 p.m. Mr. Collins saw the child. Up to this time it had been breathing with tranquillity and without difficulty, but a change for the worse had set in; symptoms of sinking appeared, and they continued getting worse until 5 p.m., when death took place, six hours after the operation.

Post-mortem.—The pharynx and upper portion of larynx were both lined or studded with a thick deposit of lymph; this was especially observable about the epiglottis and in the ventricles of the larynx; but the whole of the trachea was free from any semblance of the disease. The lower portion of each lung was hepatised. In my operation I had cut through the third, fourth, and fifth rings of the trachea.

Although in each of these cases the ultimate result of the operation was the same, there is presented in them a difference as to the nature and the severity of the disease for which the individual operations were put in force, as well as the amount of benefit which was produced by them. In the first case detailed there is presented to us an instance of croup which had run its course with extreme rapidity, and which was accompanied by symptoms of great severity. It was a case in which the operation appeared to be the only resource left. So exhausted, indeed, was the little patient, that the shock of cutting through the tissues, with scarcely any loss of blood, apparently destroyed life. But after the trachea was opened, the child was revived from a seemingly hopeless condition, and an extraordinary improvement was the result. It seemed as though this improvement would go on, when, from some cause or other which could not be ascertained, the patient was suddenly asphyxiated. Possibly the tube may have become blocked up, and the nurse may not have cleared it in sufficient time. It was evident that death was from sudden asphyxia.

On the *post-mortem* examination, it was found that there was no reason to regret that the operation had been done, for the appearances indicated that it was a case where tracheotomy might give a fair chance of life. The false membrane was neither thick nor closely adherent, nor did it extend into the bronchi, and the lungs were comparatively free from disease.

In the case next detailed, there are striking differences in many points. The disease had existed for a much greater length of time, and the symptoms were by no means so distressing as in the first instance. The operation gave not only the same temporary relief, but the relief

which was given was prolonged to a much greater period of time, the patient having lived thirty-six hours after it. Yet on *post-mortem* examination, it was found that the disease had existed in its most intense form, the false membrane being very thick, and being extended into the ramifications of the bronchial tubes. It is in this condition of the disease that there can be so little hope of tracheotomy doing any good; and it is surprising that so much relief was given, and life saved so long. Moreover, in this instance, the operation itself was long and tedious, and there was a considerable loss of blood; while, in the case before detailed, the operative process itself was very much more quickly accomplished, and there was scarcely any loss of blood.

In the third case, the difference which obtained is in reference to the nature of the disease. In the two former, the affection was the ordinary inflammatory croup, the seat of it being the lower portion of the principal air-tube. In this instance, however, there is presented to us that species of croup termed by the French authors "diphtherite," which consists essentially of a deposit of inflammatory exudation in patches upon the upper part of the windpipe, upon the epiglottis, superior portion of larynx and pharynx, the trachea being free. This is the form of disease in which it is stated that the operation of tracheotomy has been most successful; and there is reason to believe that it would be so in consequence of the trachea and larger bronchi being free from the deposit. This disease, however, is for the most part the result of an attack of measles; and it is extremely likely that the lungs are, or have been, in a state of inflammation. In all probability, it was the existence of inflammation of the lungs that rendered the operation of no ultimate avail in this case.

This subject of tracheotomy appears to myself to be surrounded with many difficulties. Should the operation ever be performed or not in croup, is a question, which, perhaps, may be legitimately asked. If men of great experience are appealed to, it is difficult to get any satisfactory answer. The question could only be met by a reference to the data of the operation, which, however, have not been put together. My own feeling on the matter is, that the surgeon is placed in a most trying situation when called upon to perform this operation. He is urged on by the parents of the child to resort to any measure which may give a chance of relief to the great distress from which they see it is suffering. He feels that there is no hope for it if the operation is not done, and yet he cannot avoid the conviction, that he is resorting to a desperate measure. At the same time, he does not like to throw away this last chance, which *may* save the life which is already in such extreme danger.

This state of mind must make one undecided and timid, and possibly a case occurs where the result has made the surgeon repent that he had not given his patient this last chance. In other instances besides those above related, the question as to the propriety of this operation has been pressed upon me. The most instructive was the following:—

Case 4.—I was suddenly summoned, at 10 a.m., on the 9th of February, to a child, aged three, the father of the patient stating that it had been attacked with a fit of difficulty of breathing, and that he

expected it would be dead before he could get to his house. I at once proceeded with him, taking my instruments. On arrival I found that the child had recovered from the paroxysm, but was told that he had been fighting for breath and had grown black in the face. He was now breathing with difficulty and had all the symptoms of disease in the upper part of the windpipe. On looking into the mouth, the fauces and tonsils were seen studded with a deposit. The child had had measles about two weeks previous, and afterwards inflammation of the lungs, which had been actively treated and had been subdued. It was evident that the deposit had involved the upper part of the larynx; still the symptoms did not appear to me to justify an operation, for which the parents were rather anxious. I ordered a blister to the throat, and recommended some wine and water, and at the same time desired the parents to watch the child narrowly. I saw the child in four hours afterwards, and found it in much the same condition, but rather lower. However, he was enabled to sit up in his mother's lap. At 9 p.m. the child had a sudden fit of dyspnœa, and died before there was a possibility of getting to it.

I examined the body next day. The back part of the tongue, the fauces, and pharynx were studded with the inflammatory deposit. The opening of the glottis was obstructed by tenacious mucus, and on clearing this away I found the same kind of deposit as existed on the fauces studding the inner surface of the upper portion of the larynx, but leaving the trachea free.

Now, on seeing this case at first, I felt that in all probability tracheotomy would be required, yet the condition of the child did not appear to me to be sufficiently bad, notwithstanding the parent's description of the attack of dyspnœa; and, although strongly tempted to perform the operation, I allowed myself to defer it until the symptoms should become worse. The result of this indecision was shown. The examination after death too surely proved that the little child had become suddenly asphyxiated, and that tracheotomy might have saved life. This, at least, was the remedy indicated. Moreover, the disease was of that form in which the operation has been shown by the French practitioners to be so much more likely to be attended by success than in ordinary instances of inflammatory croup, and it must be confessed that I could not divest myself of the idea that a little more decision on my part might have prevented the fatal event.

Although I am straying from the strict subject of this communication, I will refer briefly to another condition in which tracheotomy is sometimes called for. I am alluding to those instances where young children have been affected with scarlatina; and where, after the acute stage of the disease has subsided, life is suddenly placed in imminent danger, by rapid enlargement of the cervical glands. It must have occurred to those practitioners who have attended much among the poor children of large towns to have seen this, and it is now and then observed in that class of life where there is want of neither wholesome food nor pure air. In such a case the cervical glands enlarge to such an extent, that great pressure is exerted upon the windpipe, and the child is placed in imminent danger of being suffocated. It is then that the propriety of tracheo-

tomy is suggested to our minds; and it is impossible to attend one of these cases without seriously thinking of this. Unfortunately, however, it happens that the pressure is exerted upon the œsophagus or pharynx at the same time, and that the patient is unable to swallow. If such be the case, it will only add to suffering to perform the operation of tracheotomy; for, even if the dyspnœa is remedied by an artificial opening, the effect can only be beneficial for a short time, if the patient is unable to swallow.

A few weeks ago I was called to a case of this nature, where possibly it might have been a justifiable measure. The patient was a fine little boy, the son of parents well to do in the world; he had had a very bad attack of scarlet fever, the acute stage of which had gone by. On the eighth day, however, some enlargement of the cervical glands on the right side of the neck took place, for which leeches were used. In the following night there was a sudden change for the worse; the swelling had become in a few hours nearly as large as the fist, and very tense; the boy was much distressed, and breathing with difficulty. I was called to him whilst in this state. I ordered a repetition of the leeches, and small quantities of wine and beef-tea at frequent intervals. In the course of a few hours more the symptoms had increased, the dyspnœa becoming more marked, and he was now able to swallow a very small quantity of fluid, cautiously given in a teaspoon. The question of tracheotomy now suggested itself to my mind, and the parents were spoken to about it; but they were not anxious that it should be done. The symptoms from which the little boy was suffering rapidly became more severe, and he died before night.

In this instance I did not urge tracheotomy, because it was apparent that there was as much pressure upon the pharynx as upon the air-tube; moreover, the boy had been so much depressed by the poison of scarlet fever, that I was fearful he might die during the operation. It is, however, in a case of this nature that circumstances might occur which would render this proceeding perfectly justifiable.—*Med. Times and Gazette, March* 5, 1853, *p.* 244.

DISEASES OF THE ORGANS OF DIGESTION.

28.—ON MUCOUS MEMBRANE—EPITHELIUM.

Structure of the Bronchio-Pulmonary Mucous Membrane.—In some preliminary observations on the pathology of the bronchial membrane, Dr. C. Black states the result of his examination of the normal membrane. This he describes as consisting of an epithelium; a basement or germinal membrane, on which the epithelium rests; and thirdly, of a layer of simple fibrous tissue, vessels, and nerves, subjacent to the basement-membrane. The epithelial cells are oval, polygonal, nucleated, and have their free surface set with delicate cilia. He believes that the epithelium (contrary to the opinion of some histologists) is prolonged into

the ultimate pulmonary cells. If a very thin slice of pulmonary tissue be taken from the surface of the lung, and macerated for a short time in distilled water to decolorize it, and be then examined under the microscope, such cell will be found to have a perfect lining of epithelium.

The basement-membrane is spread out in a thin structureless layer, which is continued into the ultimate air-cells, constituting a part of their walls. Its thickness in the larger bronchi measures from 1-18,000th to 1-20,000th of an inch. It is found studded at equidistant points with small projections, which he regards as the germinal nuclei of epithelial cells. He regards the composition of the basement-membrane as similar to that of the blood-plasma after coagulation of the latter; that its existence is temporary, and that it is being continually disintegrated at its epithelial surface for the maintenance of cell-growth. The third layer, or the fibrine, consists of white and yellow fibrinous elements. The section of the bronchial membrane, microscopically considered, consists of definite, isolated, granular cells, floating in a viscid homogeneous fluid, which latter is the contents of the cells that have already attained their full growth, and have liquified in the natural process of decay. As an accidental, yet almost invariable, constituent of the bronchio-pulmonary secretion, will be found shreds or débris of the cell-walls. The granular cells or mucus-corpuscles (so called), when they have attained their full development, measure 1-1500th to 1-2500th of an inch. In this condition they are isolated, present a dark, well-defined outline, and are more prominent than pus-cells, with which they are frequently confounded.—*Brit. and For. Medico-Chirurgical Review, April,* 1853, *p.* 544.

29.—THE GENERAL PATHOLOGY AND TREATMENT OF DYSPEPSIA.

Extracted from the Clinical Reports of Professor Bennett.

Our knowledge with regard to the offices performed by the gastric, biliary, and pancreatic juices in digestion has of late years been much advanced. Thus the gastric juice more especially operates on the albuminous, and the pancreatic juice on the fatty compounds of the food. The function of the bile is perhaps more obscure, although it probably acts as a means of precipitating or separating some of the excretory matters from chyme, and so facilitates assimilation of the nutritive portions. Digestion may be deranged by all those causes which too much increase or diminish the secretion of these three fluids. Thus, excess of acidity in the stomach is one of the most common causes of dyspepsia, producing that form of it which accompanies scrofulous and tubercular diseases. It may be in such excess as to neutralise the alkaline action of the pancreatic juice, and render it difficult or impossible to emulsionise fatty matters. In such cases, alkalies, with bitter tonics and the direct introduction of animal oils in excess, are indicated. On

the other hand, the gastric juice may be diminished in quantity, as frequently occurs in persons who suddenly overtask the powers of the stomach at feasts, or in old persons with feeble digestion. The sense of load after eating is generally indicative of slow digestion from this cause. In acute cases, a stimulant rouses the stomach to increased action, and hence the moderate use of drams and generous wines after dinner is occasionally useful. In old persons the sense of load and feebleness is best removed by giving up tea, and drinking at night a little weak brandy and water. In chronic cases, acids are indicated, especially muriatic acid. The tr. ferri. co. of the pharmacopœia is a useful preparation in chlorotic females. We have no distinct means, as far as I am aware, of rousing the pancreas into action, and yet many cases are on record in which fatty matters have passed undigested through the alimentary canal in consequence of obstruction to the pancreatic duct. In such cases, and all those in which fatty matters are difficult to digest, alkalies, especially the liquor potassæ with vegetable tonics, are indicated. When the bile is deficient, constipation and dyspepsia are usual results, and are to be relieved by gentle mercurial purgatives, with extract of taraxacum, and by remedies, such as rhubarb and especially the compound rhubarb pill, which, by acting on the duodenum, also favour the flow of bile into the upper part of the alimentary canal. Dr. Clay, of Manchester, has recommended in such cases the administration of ox-gall, a remedy which, although not extensively given, is evidently rational, and calculated by its purgative action to be highly serviceable. Excess of bile, on the other hand, ought to be treated by drastic purgatives, diuretics and diaphoretics, according to circumstances, to cause excess of excretion. Exercise should also be insisted on to call the lungs into action, and thus relieve the liver in its office of separating hydrocarbon.

A derangement of the consecutive and harmonious action of the alimentary canal is another frequent cause of dyspepsia, for it is as necessary that those portions of the food which are not assimilable should be removed out of the economy, as that the nutritive materials should be absorbed. Hence, whatever impedes the contractility of the intestinal canal, whatever alters the structure of its mucous membrane, or whatever mechanically obstructs its calibre, may always be observed to induce dyspeptic symptoms. The removal of these various conditions, whether by stimulating the nervous centres, by appropriate diet, or by purgatives and astringents, as they may be required, need not be more particularly dwelt upon.

In many cases of dyspepsia, two or more of these classes of causes may be combined, so as to render the indications for treatment complex and apparently contradictory. In other cases, one or more causes may exist, although from the indications presented they cannot be determined, when our treatment must always be more or less vague and unsatisfactory. Lastly, there are a few instances where dyspepsia can only be explained by *idiosyncrasy*, in which we find this or that particular article of diet to derange the digestive functions, and in which avoidance of the offending cause is the only plan that is attended with success.—*Monthly Journal of Med. Science, Feb.* 1853, *p.* 164.

30.—*On the Efficacy of Chlorate of Potash in Ulcerated Stomatitis and Cancrum Oris.* By Dr. J. H. Babington.—[In an epidemic of ulcerated stomatitis which occurred in the Coleraine Union Workhouse, in 1849, the chlorate of potash was used with great success.]

The symptoms were as follows:—The lips, gums, and lining membrane of the cheeks were red, swollen, and tender to the touch; tongue swollen and indented by the teeth, covered over the surface with a foul tenacious coating, and in some places ash-coloured sloughs. There was great pain when the cheeks were moved, touched, or any food introduced into the mouth, together with considerable general fever, and the secretions vitiated.

The first morning I observed the disease, two only complained; next day three more cases were presented; and on the fourth morning I had fifteen on the sick list, all from amongst the boys in the workhouse.

The treatment adopted was a mild aperient of rhubarb and magnesia, and the administration of chlorate of potash, dissolved in water sweetened with syrup, in doses of four grains every fourth hour; the mouth was also washed with a weak lotion of solution of chloride of soda. They all recovered in about six days. I treated one case with alteratives and tonics, and it was three weeks before it got quite well; thereby proving the efficacy of the chlorate of potash.—*Dublin Quarterly Journal of Med. Science, Feb.* 1853, *p.* 236.

31.—*Chloroform in Sympathetic Vomiting.* By Dr. Thos. Inman.—[For this symptom two classes of remedies are generally resorted to—stimuli, or direct sedatives. One of the most valuable of these is creosote, but on account of its many disagreeable qualities, Dr. Inman suggests chloroform, in the dose of three or four drops, well shaken up with water, to be used in its place. He says,]

I do not know whether the suggestion is new, it was forced upon me by circumstances. A friend came to visit us across the sea, suffered urgently from sea sickness, which continued long after her arrival, to such an extent that any motion of the body produced vomiting. Not having anything else in the house but chloroform, I gave some of that, and was gratified to find that its success was immediate. The next case was one occurring in the practice of a friend, where the vomiting had been kept up incessantly for three days, and where creosote had been unavailing. The vomiting was partly due to an overflow of bile, and partly to pregnancy: it continued, however, after the flow of bile had ceased, and was beginning to weaken the patient materially. The first dose of chloroform (five drops) checked the vomiting for six hours; there was then a slight repetition of the sickness, which, however, disappeared entirely after another dose.

The next case was one of vomiting from disorder of the liver. The first dose put a stop to the sickness, and had not to be repeated.

My next experience was in the case of the lady I first mentioned, who found it useful in preventing sea-sickness.

I have induced some of my friends also to try it, and they give an equally favourable report concerning it.

Its chief advantages over creosote are, its pleasant taste in the mouth as it goes down, and its not unpleasant flavour if it comes up again. The only point requiring attention is, that the mixture must be well agitated immediately before being taken, as the chloroform rapidly falls to the bottom of the spoon or glass.—*Med. Times and Gazette, March* 5, 1853, *p.* 252.

32.—ON THE TREATMENT OF SARCINA VENTRICULI.

[At a meeting of the London Medical Society, Dr. Hassall, in speaking of the treatment of this affection, said,]

One of the chief indications was certainly to destroy the fungus; and this he thought was to be effected by two means: first, by the regular and systematic exhibition of alkalies, so as to neutralize the acidity of the contents of the stomach, and which acidity formed a condition essential to the development of the parasite; and, secondly, to administer some remedy capable of exerting a destructive effect on the fungus. With these objects in view, infusion of quassia and bicarbonate of potash were prescribed in mixture, and doses of the sulphite of soda separately, the diet being also regulated. After the lapse of a short time, Dr. Hassall learned, that although the sulphite of soda had not been taken, but only the quassia and bicarbonate of potash, yet a marked and encouraging improvement in the symptoms had taken place, the frequency of the vomitings especially being diminished. Subsequently the sulphite of soda was administered; this remedy, together with the potash and quassia, having the effect of stopping entirely the vomitings for a period of five weeks—in fact, up to the date of Dr. Hassall's communication to the Society. Not only had the vomitings ceased, but the bowels, before so obstinately confined, had become perfectly regular; there was no distention of the stomach, or flatulence; the urine was clear, free from deposit, and passed in normal quantity; exertion does not now cause fatigue as formerly, and the sleep is invariably sound and refreshing.

[Drs. Lankester and Fuller doubted the efficacy of the quassia in the case; and Drs. Fuller and Hare referred to cases which had been completely cured by the sulphite of soda. Dr. Hassall, after some further observations, explained the use of the sulphite by saying, that]

The *modus operandi* of the sulphite of soda in cases of sarcina appeared to be this: The sulphite is decomposed in the stomach by the acids generated therein, and the sulphurous acid gas is liberated, the destructive effects of which upon parasitic formations like the sarcina was well known.—*Lancet, Jan.* 29, 1853, *p.* 120.

[In reference to this subject, Mr. St. John Edwards, of University College, remarks, that acid fluids are necessary to the development of most fungi. The value of the treatment of this disease by the sulphite of soda is:—That by the acid of the stomach combining with the alkali,

the sulphurous acid is given off and acts as a poison to the sarcina. The recommendation of Dr. Hassall therefore, that alkalies should be administered along with the sulphite, would tend to diminish the activity of the remedy. Mr. Edwards remarks:]

The only instance of the effect of the coetaneous administration of an alkali with a sulphite that I know of is contained in the following extract from a lecture delivered by Dr. Jenner, at University College Hospital, and published in the 'Medical Times' for Aug. 23, 1851, p. 193, "On account of the burning pain which he occasionally complained of, I now ordered him a mixture containing sodæ carb. ℈ij. in each dose. On the 13th, 15th, and 16th, he again vomited sarcinæ in quantity, and, as I suspected that the soda prevented the evolution of the sulphurous acid, I omitted the carbonate. From the 16th of May to the 19th of June the vomited matter contained no trace of sarcinæ or torulæ."

In this case the soda was taken at times calculated to interfere as little as possible with the action of the sulphite.—*Med. Times and Gazette, March* 19, 1853, *p.* 301.

33.—*Chloroform in Colic, particularly in Lead Colic.*—Dr. Aran, of Paris, warmly recommends the administration of chloroform in repeated doses of from ten to twenty drops, in colic, and particularly in lead colic. He says, that it relieves the spasm more effectually than opium or belladonna, and moreover possesses the great advantage of being more safely repeated than either of these medicines. A hundred and fifty drops may, according to Aran, be given in 24 hours; and we have no doubt that even a larger quantity, though seldom required, may be safely administered, as chloroform is very quickly eliminated from the system. In corroboration of the value of chloroform n colic, the writer of these lines adds his experience of its efficacy in his own case. He had suffered the most excruciating pain in the back and abdomen for twenty-two hours, accompanied by incessant vomiting, which opium and hydrocyanic acid failed to mitigate: indeed, they were rejected as soon as taken. A dose of twenty drops of chloroform was then taken, well mixed in a little water. After this, there was no more sickness, and almost instantaneously the pain began to abate, and in ten minutes had entirely subsided. Upon a return of the pain, some hours afterwards, it was again and finally removed by a smaller dose of chloroform. The necessary purgatives were afterwards easily retained, and the cure completed.—*Association Med. Journal, Jan.* 7, 1853, *p.* 18.

34.—REMARKS ON THE TREATMENT OF DIARRHŒA BY SULPHURIC ACID.

By S. W. North, Esq., District Medical Officer to the York Union.

During the past two or three years diarrhœa has prevailed to a much greater extent than usual, and consequently much labour has been bestowed in the investigation of this disease, and various new methods of treatment have been suggested, amongst which none has attracted so

much attention as that by sulphuric acid; and seldom has any single remedy gained so deserving a reputation in so short a time. Nevertheless, in the hands of many this remedy has failed in its results to realise anything like the advantages it was said to possess over other methods of treatment in use for the relief of this affection. This, I think, is mainly owing to a want of discrimination in the choice of cases suitable for its use, for it is too much the custom to treat diarrhœa on a routine plan, without reflecting that similar symptoms may, and often do, spring from widely different causes, and are to be combated by as different treatment.

When diarrhœa prevails extensively, as it did during the summer and autumn of last year, we may clearly recognise two forms of this affection, somewhat similar in their symptoms, but differing materially in their origin, and requiring distinct methods of treatment.

The one, simple diarrhœa, caused mainly by the kind of food abundant at this season, and generally to be attributed to either errors of diet, or some temporary derangement of the biliary system, and the symptoms of which are copious and frequent fæculent evacuation, slight nausea, griping, and tenesmus; the disease frequently being cured spontaneously in the course of a day or two, with no other ill effects than temporary debility, and seldom requiring any other treatment than mild oleaginous purgatives, and sometimes a few doses of chalk mixture and opium.

The other form is the one most deserving of attention, as well from the severity of its symptoms as the tendency which it has to lapse into low fever. The following is the usual history of the case:—The patient was either quite well a few hours before, or perhaps had suffered from slight relaxation of the bowels for a day or two, when, without having committed any errors or irregularities in living, he was seized with profuse diarrhœa, the evacuations consisting at first of the contents of the bowels in a very fluid state, ultimately becoming like dirty water, and containing little if any solid matter; nausea and vomiting of large quantities of fluid; severe spasmodic pain in the stomach and bowels; cramps in the extremities, often very violent; the pulse small and frequent; tongue moist, and either clean or only slightly covered with a brownish fur; the surface cold and clammy; countenance anxious; these symptoms being followed by a continued fever, varying in duration from a few days to a week or two. Such is the general character of this form of the affection, presenting itself with various degrees of severity, from, apparently simple diarrhœa, to an extent almost bordering on that of Asiatic cholera.

The symptoms most worthy of note, and which seem to me to be sufficient reason for distinguishing this from the preceding form of diarrhœa, are the peculiarly fluid evacuations, the severe cramps in the extremities, and, above all, the consecutive fever. Add to this, that the cases which have fallen under my observation were most numerous in ill-drained and badly-ventilated localities, where we might expect to find epidemic disease most abundant; that numerous cases occurred in the same locality; and I think we may fairly ask ourselves whether this is not a distinct disease of an epidemic character, the therapeutical indications of which may more appropriately be classed with those of Asiatic cholera and typhus.

It is in diarrhœa having this character that I found the sulphuric acid a most valuable remedy, frequently in a few hours restoring the patient from a condition of extreme distress to one of comparative comfort.

I usually administered the dilute acid in doses of half a drachm, with a drachm of compound tincture of cardamoms, in an ounce of water, at intervals of from one to three hours, according to the urgency of the case; the almost immediate effect of which was, cessation of the vomiting and purging, the surface becoming warm, and the countenance losing its anxious appearance, the cramps in the extremities gradually abating. Six or eight doses generally sufficed to arrest all the urgent symptoms, and, in most instances, the patient was convalescent in two or three days. In similar cases, treated by the ordinary stimulants and astringents, the nausea and diarrhœa often continued for several days, the tongue becoming loaded with a thick brown fur, severe headache, thirst, and other febrile symptoms; the stomach and bowels not recovering their healthy function for many days; or, what was not unfrequent, the diarrhœa assuming a dysenteric character.

The advantages of the acid over other methods of treatment seem to me to be, that it is more grateful to the patient; that it relieves him of all the urgent symptoms more speedily, and that the stomach and bowels assume their healthy functions in a much shorter time than under any other plan of treatment: and, lastly, that this remedy is not expensive—circumstances of no small advantage when we have to treat large numbers of the labouring class; for to them the question as to whether they are to be able to resume their work in a few days, or not for two or three weeks, is not a mere question of bodily suffering and inconvenience, but one to many of comfort or want to themselves and families.

How this medicine acts I leave to others and to future observation to determine. Of its value as a remedial agent in this class of affections, I have no doubt. One caution I would add, viz., that, when a few doses fail to relieve the patient, it is better not to persevere; for a long continuance of the acid, in large doses, is of itself sufficient to set up a troublesome and unmanageable irritation of the mucous membranes of the stomach and bowels. If it is to act satisfactorily will be shown by the result of a few doses.—*Med. Times and Gazette, Feb.* 12, 1853, *p.* 159.

35.—ON THE COMPARATIVE VALUE OF ANTHELMINTICS.

[Dr. Küchenmeister made a great number of experiments relative to the value of those remedies used for the destruction of worms. In the course of his observations he ascertained that electricity was not itself a vermifuge, though he used it to prove the death of the worm, as the most delicate reagent. Speaking of kousso, he says:]

A living *Tænia crassicolis*, procured from a cat, was placed at four o'clock in a mixture of albumen and dolichos pruriens. The worm appeared to be perfectly well in this mixture, and at two o'clock on the following afternoon exhibited most vigorous movements. It was now

transferred to a vessel containing a mixture of infusion of kousso and some of the infused as well as of the fresh powder, with albumen. The temperature of the mixture was 99·5° F. On its introduction, the worm quickly extended itself; after some time it was found to be dead, its colour having changed to a dirty reddish-yellow. Two *Tæniæ serratæ* were placed at half-past one in the afternoon in a mixture of albumen and kousso; at two o'clock they were dying, and at three completely dead. Two *Tæniæ serratæ* from the same dog were brought into contact with kousso and milk at half-past one in the afternoon, and at two o'clock were dead. Two *Tæniæ serratæ* were placed at half-past one in the afternoon in albumen, mixed with decoction of pomegranate root and with some of the powdered root: they died in three hours. Two others were placed in milk mixed with the decoction only: they died in three and a half hours. A *Tænia crassicolis* was put into a mixture of albumen with ethereal extract of male fern: it died gradually in three hours and three quarters. A number of *Tæniæ cucumerinæ* were placed in a mixture of albumen and oil of turpentine: they were dead in an hour and a quarter.

A number of the same were put into a mixture of albumen and castor oil; they were lively at first, but died in seven hours. Similar worms were put into a salad, composed of pieces of unwatered herring, boiled potatoes, large pieces of onion and garlic, albumen, vinegar, and a large quantity of oil. They died in eight hours. Lastly, the author tested the vermifuge powers of the brown oxide of copper: fifteen grains were administered in the course of four days to a strong cat. When the body was opened, the entire intestinal canal was found to be full of fluid, yellow, flaky fæces; the intestine was softened, and denuded of epithelium, especially at the termination of the ileum, where the adjoining Peyer's glands were much swollen, particularly in two situations, one of which was an inch and a half long by one-third of an inch broad; the other was nearly circular, and its diameter one-third of an inch. The cat had been purged. The tæniæ and ascarides it contained were lively. It would hence appear that this substance is inefficacious as a vermifuge, and dangerous to the system.

The following table contains the results of the above experiments:—

In milk boiled with kousso tæniæ died in half an hour.	
In a mixture of oil of turpentine and albumen, in	1 to 1¼ hour.
In decoction of kousso with albumen	1½ ,, 3 hours.
In decoction of pomegranate root with milk	3 ,, 3½ ,,
In decoction of pomegranate root with albumen...	3 ,,
In ethereal extract of male fern with albumen....	3½ ,, 4 ,,
In castor-oil with albumen	8 ,,
In salmagundi with garlic and onions	8 ,,

Kousso therefore seems the most efficacious remedy against tæniæ. When pomegranate bark and male fern root fail, their failure may be owing to the habit of administering a laxative in from four to six hours after the exhibition of the vermifuge, by which the latter may be carried beyond the worm. With regard to pomegranate root, it must be observed that in large doses it occasions diarrhœa. The same remark applies to castor-oil.

The following are the results of the author's experiments:—1. An ascaris lived from eighteen to twenty hours in albumen into which some camphor had been introduced. 2. A mixture of oil of turpentine and albumen killed some ascarides which were placed in it from two and a half to six hours. 3. Ascarides lived forty hours in albumen and wormseed, whether the latter was employed in the form of powder or infusion. 4. Some ascarides were placed in albumen mixed with santonine; they did not die in it, nor did they die in a watery infusion of santonine. When santonine was dissolved in oil, especially in castor-oil, and mixed with albumen and ascarides, the latter died in ten minutes. An injection of santonine and castor-oil was thrown up the rectum of a cat, and produced numerous motions containing dead worms; and on killing the cat, the entire of the lower portion of the intestinal canal was ascertained to be free from worms, while four were found near the stomach quite rigid and extended, and retaining but little life. A *Tœnia crassicolis*, however, was found in the intestines, and appeared to be quite uninjured and very lively. 5. A mixture of albumen and aniseed, with a strong infusion of the latter, killed the worms in about twenty-four hours. 6. Parsley, mixed with albumen, killed ascarides very slowly. 7. Flour of mustard and albumen destroyed them in about four hours. 8. In rue the worms lived upwards of twenty-four hours. 9. The same was the case with millefoil. In contact with tansy, valerian, and camomile, great numbers of them lived for twenty-four hours. With onions and garlic they perished in from ten to fifteen hours. A decoction of cloves, with or without albumen, killed them in twelve hours. In an infusion of ginger, with or without albumen, they lived about twenty-four hours. Petroleum, mixed with albumen, killed them in less than six hours, as did also oil of cajeput and albumen.

A series of vermifuges, taken from the class of balsamics, namely, assafœtida, ammoniacum, balsam of Peru, extract of juniper, and Venice turpentine, was tried in like manner. In all these the worms lived more than twenty-four hours. Of the class of empyreumatics, the following were tried:—Oleum Chaberti (a mixture of four parts of oil of turpentine, and one of the animal oil of Dippel), oil of amber, castor-oil, tar water, creasote, wood-vinegar, and wood-soot. In these, for the most part, the worms lived from twenty-four to forty-eight hours; except the wood-vinegar, in which they lived rather more than twelve; and creasote, in which they died within two hours. Of bitters, the author tried aloes, gamboge, ox-gall, wormwood, myrrh, gentian, quassia, hops, bitter orange, and acarus calamus; in all these the ascarides lived from twenty-four to forty hours. Of astringents he tried pure tannic acid, pomegranate root, kousso, extract of walnuts, cinchona bark and quina, elm bark, willow bark, the flowers and stalks of meadow sweet, oak bark, dragon's blood, catechu, and kino. In these the worms died in from twenty-four to thirty hours, with but two exceptions, namely, tincture of galls and pomegranate root, both of which killed them in the space of eleven hours. Of saline preparations, sulphate of soda, chloride of sodium, and the roe of herring were tried. In the first, the worms died in from fifteen to eighteen hours; in the second, in from two to six; and in the roe of the herring, in four hours. The following me-

tallic poisons were experimented on: arsenic, calomel, corrosive sublimate, and the salts of tin, of lead, and of copper. Corrosive sublimate alone destroyed the worms in so short a time as two hours; all the other metallic salts required a much longer period. From these experiments it would appear that santonine mixed with oil is the most powerful vermifuge, then chloride of sodium, the roe of the herring, garlic, onions, &c. The author advises that santonine should be given as a vermifuge, mixed with oil, in the proportion of from two to five grains, to an ounce of castor-oil. This solution should be given in the doses of a teaspoonful until the effect is produced. As auxiliary treatment, chloride of sodium, herring-brine, mustard, onions, and garlic, may be employed.—*Froriep's Tagsberichte über die Fortschritte der Natur-und Heilkunde.* Pharmakologie, Band 1, p. 317.—*Association Med. Journal, Feb.* 11, 1853, *p.* 134.

DISEASES OF THE URINARY ORGANS.

36.—THE ACTION OF LIQUOR POTASSÆ ON THE URINE IN HEALTH.

By Dr. E. A. Parkes, Professor of Clinical Medicine in University College.

[The following epitome of this subject is taken from an elaborate article in the 'British and Foreign Medico-Chirurgical Review,' by Dr. Parkes:]

The effect produced by liquor potassæ on the healthy system may be thus recapitulated. If this remedy be taken soon after meals, its action is that of an antacid. It combines with hydrochloric or with lactic acid, and then, doubtless, passes into the circulation. What appreciable effect it now produces is not indicated in the tables above given, but it does not increase either the water, solids, or sulphuric acid of the urine. If the liquor potassæ be taken into an empty stomach, it passes unneutralized into the circulation, and probably through the veins; in so doing it must produce an effect on the walls of the capillaries and small veins, but the extent of this cannot be known. As much as ʒ ij. have been taken with only 4oz. of water, without causing epigastric pain or uneasiness (although it produced considerable temporary scalding of the mouth and throat), and without apparently producing any local effects in the stomach. In, usually, from thirty to ninety minutes after its entrance into the circulation, an increased flow of slightly acid urine occurs, which contains the whole of the potash, organic matter differing considerably from that of ordinary urine, and a relatively large proportion of sulphuric acid: the phosphoric acid and the chlorine are less changed. Perhaps an organic acid (not uric, and probably not hippuric)

is also present. The explanation of these facts is, that an albuminous compound, either in the blood itself, or in the textures, has become oxidized; its sulphur, under the form of sulphuric acid, has united with potash, and, with possibly the changed protein-compound, is poured out from the kidneys. This oxidizing effect of the liquor potassæ is no doubt assisted by exercise, and by copious draughts of water; but in the above experiments, exercise and fluid were abstained from, in order not to complicate the results. The amount of albumen or fibrine destroyed by one drachm of liquor potassæ cannot be considerable, but if the potash were continued in large quantities, oxidation could probably be pushed to any amount. The nitrate and acetate of potash did not in a *healthy system* have the same effects.

After the increased flow of urine, the quantity passed per hour falls slightly below the standard. It appears to resume its ordinary composition, but its exact condition at this period has not been determined. Some observations on urine in disease, would lead me to infer that the uric acid will be found to be increased.

Such were the effects of liquor potassæ on the urine. The effect produced on other excretions was not obvious. The skin and the intestines appeared quite unaffected, and as all the potash was found in the urine, the reason of this is easily understood. In most of the experiments there were no subjective symptoms of any kind. On two occasions, there was rather sharp frontal headache, languor, depression, slight lumbar pain, and aching of the legs, after the large flow of urine. On the night of the 15th, when the flow of urine, which was proceeding at the rate of ℥iss. per hour, was augmented in two and a half hours by ℥xiv., and no fluid was supplied to the system, the pulse became perceptibly small (almost thready) and slow; it remained equal and regular—there was no thirst, no shivering, and no nausea; the skin was dry and warm. In six hours the pulse had quite regained its force and frequency, and the other symptoms had disappeared without any fluid having been taken.

After the experiments were concluded, the general health did not appear impaired; it was, if anything, better than usual.

The effect of liquor potassæ on the diseased system is a much more difficult problem. The chemical conditions are not the same, and the effects of the potash are necessarily influenced by them. I will not now enter into this subject, but observe that it is necessary, when its oxidizing effects are desired, to give the potash eight or ten hours after food, to drink moderate quantities of water, and, if possible, to use exercise. The potash should be given pure, or with large doses of iodide of potassium, but unmixed with sugar. I may so far anticipate what will be hereafter said on this point, by stating that, administered in this way, it exerts a powerful effect on the exudations of inflammations, but appears less useful in the early stages, when an antagonistic force seems to be in action.

It remains to be seen whether the varying excretion of sulphuric acid, which is unaccounted for by diet and exercise, is occasioned by greater or less alkalinity of the blood producing variations in the amount of oxidation of the albuminous compounds.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 272.

37.—ON THE PRESENCE OF PUS IN THE URINE.

By Dr. R. B. Todd, F.R.S., Physician to King's College Hospital.

[The presence of pus in the urine is a formidable symptom, and makes the medical attendant anxious to ascertain its exact source. Now what are the means by which the presence of pus may be detected?]

Suppose a specimen of urine is brought to you in which pus is suspected to exist, how do you proceed to detect the pus? and how can you distinguish it from other deposits which we know to the naked eye present appearances not unlike those of pus? The remarks which I shall make on this point will apply to those cases in which we have a fair amount of pus present,—a quantity, in fact, sufficient to form more or less of a deposit evident to the unaided eye.

Urine containing pus, then, generally exhibits a certain cloudiness or muddiness, so that when you hold it up to the light you cannot see through it; the clear, transparent appearance of the healthy secretion is absent. If you have an opportunity of inquiring into the circumstances under which this urine is passed, you will find it has been muddy from the moment when it was passed, and that it had not become so after standing for some time. This constitutes another distinctive character of urine containing pus, and enables us to distinguish it from lithate of ammonia, which sometimes forms a deposit that exhibits much of the general appearances of pus; for the urine from which the lithate of ammonia is deposited is always perfectly bright and clear when first passed, and becomes turbid only after it has cooled, the lithate of ammonia being perfectly soluble in the secretion while warm. Hence you should always be particular to ask the patient if his urine is clear when passed, unless you have an opportunity of seeing and testing it yourself; but this we are frequently prevented from doing, and it becomes important, therefore, to gain as much information as possible with reference to this very important symptom. If the urine be clear when passed, and becomes muddy only after standing, we may lay it down that the turbidity depends upon lithate of ammonia, and not upon the presence of pus.

Purulent urine, besides possessing this muddiness, has also this character,—that after a time a deposit from it collects at the bottom of the vessel, and forms a layer, varying in thickness, (according to the quantity of pus present), of a yellowish green material, which has a creamy consistence. This deposit leaves the supernatant fluid more or less clear, according to its greater or less completeness; but frequently the urine continues to hold a certain quantity of pus in suspension, which leaves a certain amount of turbidity or milkiness in the supernatant fluid. If the urine be allowed to stand for some time, this greenish layer of pus undergoes certain changes, by which the decomposition of the urine is brought about; and the fluid soon becomes alkaline, owing to the presence of carbonate of ammonia, which is caused by the decomposition of the urea. At the same time, the alkali, thus developed, reacts in a peculiar way on the pus, which is observed to become thick, viscid, and ropy, and to lose its minutely granular appearance, becoming more or less transparent, and forming what has long been described

as glairy mucus. It has been found that potash (and I believe the observation was first made by Dr. Babington) also re-acts in this manner upon pus, and, in consequence, it becomes a valuable re-agent to enable us to detect the presence of this substance.

Here I take a specimen of urine exhibiting the general characters which I have just described as being characteristic of purulent urine. You see there is an abundant creamy-looking deposit; and if I pour off the supernatant fluid, and add a little of this liquor potassæ, you will perceive the change occur which I have just mentioned. As I shake the vessel, you observe the deposit becomes tenacious and glairy, so that, when I attempt to pour it into another vessel, it does not drop, but runs off in a viscid stream, very like uncoagulated white of egg; indeed many persons might mistake this glairy mass for white of egg. Pus altered in its character in this manner by the carbonate of ammonia, set free in consequence of the decomposition of the urea, was, until late years, ordinarily considered as a deposit of glairy or ropy mucus; but it has since been shown that mucus never assumes this particular form of a ropy sediment, which sinks to the bottom of the vessel; nor does it ever exist in the urine in such quantity as we frequently find this altered pus.

I have said that purulent urine is always muddy; but this is not a character by which we are enabled with certainty to say whether a given specimen contains pus. Urine may be muddy from other causes; I mean, urine may exhibit a muddy appearance as soon as it is passed from the presence of other deposits besides pus. Phosphatic urine is also muddy, and often much resembles purulent urine; but generally it appears paler than the latter. After phosphatic urine has been standing for some time, a deposit is always found just as it occurs in purulent urine; but, in the former, the deposit is usually white instead of being yellow, and is flocculent and light instead of being thick and heavy. We also observe this very important difference between these two forms of deposit, that the addition of a little acid renders the phosphatic urine perfectly clear, while it increases the turbidity of the other. This re-action will always enable us conclusively to distinguish between a specimen of urine muddy from the presence of pus and one which is rendered turbid by the precipitation of phosphates. Phosphatic deposits are all readily soluble in dilute mineral acids, and are precipitated again from the acid solution by ammonia. Purulent deposits are not dissolved by dilute acids; but frequently the turbidity is increased, owing to the precipitation of a little albumen from the liquor puris. Another distinctive character of urine containing a considerable amount of phosphate is, that it is usually, though not always, alkaline; while purulent urine more frequently exhibits a slightly acid re-action, at least when quite fresh, or it may be neutral; but we do not frequently meet with urine of this description of a strongly acid re-action, unless the patient is taking large quantities of mineral acids at the time. Then, as I mentioned to you just now, we have in alkalies a most excellent and easily-applied chemical test, which will enable us with certainty to discriminate between these deposits; and liquor potassæ has been found the most convenient alkali which we can use for the purpose, as it will keep

well, and requires no great profundity of chemical knowledge in its application; and, so far as I know, is not open to any sources of fallacy.

There are other points distinctive of urine containing pus. If we apply heat to the clear fluid after the subsidence of the deposit, it will coagulate, and the amount of coagulation which takes place will be in direct proportion to the quantity of pus present. This will take place if the urine be acid; if it be alkaline, you must acidulate it before heating it. The albumen is derived from the liquor puris, and hence purulent urine is always albuminous, and it is albuminous because purulent.

For an additional and unequivocal test of pus, you must look to its physical constitution. Pus consists of two essential parts, *the liquor puris*, and *the pus globules* which are held in suspension in the former, just as the blood-corpuscles are suspended and float about in the liquor sanguinis. The *pus globules* or *pus cells* are to be recognised by the microscope. If a specimen of urine contain albumen, it may be derived from the liquor puris, and may, therefore, be indicative of the presence of pus, or it may be due to the escape of serum only, as occurs in Bright's disease and nephritis. This point may be at once settled, as regards the presence of pus, by examining a drop of the turbid urine under the microscope, when we shall not fail to recognize the pus corpuscles if pus be present in the urine. These particles are somewhat larger than the red corpuscles of the blood, and differ from them in shape, being globular, while the latter are bi-concave discs. They much resemble the colourless corpuscles of the blood, but appear darker and more highly granulated than the latter. This granular appearance seems to be owing to the presence of numerous highly refracting molecules in the pus corpuscle, which are doubtless of a fatty nature; and to them, most probably, the change which occurs on the addition of liquor potassæ is due, the fatty matter being converted into a soap by the alkali. When treated with acetic acid, the pus corpuscles exhibit two or three circular bodies in the centre, having much the appearance of oil globules. Some corpuscles are found to contain three or four of these bodies; others two; and in some, only one can be detected. The presence, then, of particles like these will enable you to distinguish pus from all other deposits which occur in the urine.

We have also to distinguish the pus deposit from deposits of mucus. Mucus seldom forms a distinct stratum, like pus: if viscid, it is so when acid; but pus exhibits the glairiness, which renders it liable to be mistaken for mucus, only when it is alkaline. If we examine mucus under the microscope, we shall not fail to detect more or less of epithelium, and the so-called mucus particles in small numbers, which, doubtless, are incipient pus corpuscles. Mucus, again, does not re-act, like pus, with solution of potash, and it is soluble, to a great extent, in acetic acid.

Having considered the more prominent features of deposits of pus as they occur in the urine, let me say a few words upon the various sources from which the pus which is found in the urine may have been derived, and the circumstances which may give rise to its formation. The pus may have been developed from the lining membrane of any of the surfaces over which the urine would flow as it passes from the kidneys, or in con-

tact with which it would come. It may come from the urethra in the male; and in the female it is often derived from the mucous membrane of the vagina. When we examine the urine of a female, and find pus present in it, we should always be careful to inquire if leucorrhœa be present, and in very many cases this will be found actually to be the case. It therefore becomes important to keep this in view, for I have known many persons much puzzled, from this simple circumstance. They have found pus in the urine, and have been unable, from the absence of other symptoms, to draw any conclusions with reference to its origin. Pus may likewise come from an adjoining abscess which has opened into one of the urinary passages. An inflammatory state of the mucous membrane of the bladder is one of the most common causes of the presence of pus in the urine; and inflammation of the ureter, and of the pelvis of the kidney (*pyelitis*) will also give rise to it, and, though last, not least, suppurative inflammation of the kidney itself.

When the quantity of pus discharged is considerable, I do not know of any particular feature, either of it or of the urine, by which it may be determined whether the pus comes from an abscess in the kidney, or from some of the surfaces over which the urine passes, as the pelvis of the kidney, the ureter, or the bladder.

One point in reference to this matter, which will be very important if future investigation will confirm it, is due to my friend, Dr. Beale, who thinks that, in those cases in which the pus is derived from the bladder, ureters, or pelvis of the kidney, triple phosphate is almost invariably present; but in those instances in which the pus is due to an abscess in the kidney, or to the presence of an abscess situated external to the urinary passages, and communicating with them, the crystals of triple phosphate are almost always absent.

When mucous surfaces are highly irritated, we find they have a great disposition to secrete phosphate, and this may account for the great quantity of triple phosphate we usually meet with in cases of irritation of the mucous membrane of the bladder or pelvis of the kidney. Abscesses formed in the neighbourhood of the urinary passages, and opening into them, may furnish pus to the urine. Thus a prostatic abscess may burst into the urethra, or a lumbar abscess may open into the ureter.—*Med. Times and Gazette, April* 2, 1853, *p.* 337.

38.—ON VARIOUS FORMS OF ALBUMINIFACIENT RENAL DISEASES.

From a Review of the work of Dr. George Johnson on these forms of Kidney Disease, in the 'Edinburgh Medical and Surgical Journal.'

[The morbid anatomy of the first form, viz., *Acute Degenerative Nephritis*, consists, as frequently mentioned before in these pages, of a congestive or inflammatory state of the textures of the kidney, mostly seated in the cortical part, but chiefly in the tubules, producing an exfoliation of epithelial cells and scales lining the tubules. Dr. Johnson also thinks it affects the Malpighian bodies, occasionally destroying one or two of these. Let us consider what is the]

"*Pathology of the Disease.*—Having examined the morbid anatomy of acute desquamative nephritis, we are prepared to enter upon the subject of the pathological interpretation of the various conditions which our anatomical investigations have revealed to us. In the first place, it will assist us to comprehend the whole subject, if we make some general observations illustrative of the proposition which we shall adopt as a central truth—viz., that *all the changes of structure commence in the secreting cells of the gland, and are the result of an effort made by the cells to eliminate from the blood some abnormal products—some materials which do not naturally enter into the composition of the renal secretion.*

"Allusion has already been made to the physiology of secreting cells, and it has been shown that the cells of the different glands have characteristic appearances, which render it quite easy for a practised observer to distinguish them from each other. The cells of the liver, for instance, have a very different appearance from those of the kidney. It is quite evident, too, that their appearances are not more diverse than their vital powers. The cells of the kidney have the power of secreting urine, while those of the liver secrete bile. And although, from an examination of the cells, the physiologist could not have predicted what would be the nature of their secretions, yet he rightly concludes that there is an intimate relationship between the structure and appearance of the cells and the nature and composition of their secreted products, so that he learns to attribute to a cell having certain characteristic appearances, the mysterious vital power of secreting the constituents of urine, while with a cell having certain other appearances, he associates the power of secreting bile.

"The next point which it is important to observe is, that the cells of each gland, besides the constituents of their own proper secretion, have also the power of separating from the blood certain materials which do not form a part of their normal secretion. It is well known, that many salts and many odorous and colouring matters, derived from the vegetable and animal kingdom, when introduced into the blood through the stomach, are eliminated by the kidneys; and the separation is effected so quickly and so completely, as to justify the belief, that the materials in question are secreted by the renal cells with as much facility as those which constitute their own proper secretion. In regard to some of these materials, it appears in the highest degree probable, that they may be secreted by the kidneys for a long time and in large quantities, without producing any perceptible change in the structure of the gland, or any other modification of the urine than the mixture with it of the salt or other foreign substances, with the addition, perhaps, of a certain quantity of water, which is required to keep the materials in solution. Whether any matters, not being constituents of healthy urine, can be secreted by the kidneys without producing some slight modification of the secreting cells, may perhaps admit of doubt; but the effect upon the cells is not commonly so injurious, that the physician need hesitate to give his patients for weeks, or even months, consecutively, such medicines as iodide of potassium, although he knows that this new material is continually being secreted by the renal cells, and so mingled with the urine.

"It is important, however, to observe, that there are some materials which, when secreted by the kidneys in moderate quantities, and for a short time, appear to lead to no injurious consequences, may yet produce very decided changes of structure, after the long-continued secretion of the same materials in larger quantities. We have an instance of this, in the secretion of sugar by the kidneys in diabetes. It is now a well-ascertained fact, that this disease consists in an imperfect digestion and assimilation of certain alimentary materials, as a consequence of which, the sugar which is formed in the stomach and intestines enters the blood, and is thence removed by various secretory organs, but chiefly by the kidneys. The sugar is a powerful diuretic, its passage through the secreting cells being accompanied by a flow of water from the Malpighian bodies, sufficient to keep it in solution. It can rarely happen, that an opportunity offers for examining the kidneys in the early stage of diabetes, so as to ascertain the condition of the cells at that period; but we know that for many months, several pints of urine will be secreted in the day, and this, without any evidence of the slightest imperfection in the discharge of the functions of the kidney. It is highly probable, however, that from the commencement, the secretion of sugar is accompanied by changes in the appearance of the cells; and after the long continuance of the disease these changes are very decided. In two cases of death from diabetes, I found the convoluted tubes of the kidney remarkably opaque, and having a yellowish tinge, the cells being also opaque, from containing a large quantity of finely granular matter with oil. In one case the urine had been albuminous and contained granular casts; of the urine in the other case I have no information, except that it was saccharine. The appearance of the gland-cells in the two cases was very similar and was doubtless connected with the continued secretion of sugar. An albuminous condition of the urine, with more or less of structural change in the kidney, has, as Dr. Christison remarks, been observed to occur so frequently in connection with diabetes, that their concurrence can scarcely be considered as altogether accidental. The probable explanation of the phenomena is, that the long-continued secretion of sugar by the kidneys modifies the gland-cells, effecting a change in their appearance and in their vital endowments, so that in adapting themselves to the secretion of sugar, they become more or less unfitted for eliminating the constituents of their own proper secretion. This effect of the secretion of entirely new materials by the gland-cells, is no more than might have been inferred *à priori*, from a consideration of the physiology of secretion, and of the specific characters which mark the cells, no less than the secreted products of each gland.

"We have another illustration of the effect upon the secreting cells of an effort to eliminate new materials in cases of jaundice. When, from any cause, the functions of the liver are so imperfectly performed as to allow of the bile accumulating in the blood, the urine is found to be deeply tinged with some, at least, of the constituents of the biliary secretion; and on a microscopical examination of the urine, we find the renal secreting cells in variable numbers, some being scattered, while others are entangled in moulds of the kidney tubes, and all of them coloured by the bile contained within them. When we have an opportunity of

examining the kidney after death in these cases, we find the tubes deeply tinged by the bile contained in their secreting cells, and some tubes are nearly or quite filled with cells which have been thrown off, while others have been formed upon the basement membrane beneath them. Thus it appears that when the blood circulating through the kidney contains an excess of bile, the renal cells, in striving to eliminate these materials, become deeply tinged by it, and many of them are so far modified, as to be shed by a process of desquamation.

"In the instances here adduced of a change in the structure of the renal cells effected by the secretion, in the one case of sugar, and in the other of bile, we have tolerably conclusive evidence as to the nature of the materials which have modified the cells. In many cases, however, we know nothing certain as to the nature of the material; and the evidence that there is some *materies morbi* which excites the renal disease is derived—1st. from a consideration of the circumstances under which the disease occurs. These have been referred to at some length in the preceding chapter, where an attempt was made to establish the proposition, that *all the causes of renal disease have this common feature, that they tend to produce a morbid condition of the blood.*

"2d. We gain additional evidence upon the point in question from analogy. We know that during the process of normal secretion, there is no visible shedding of secreting cells; but we have seen that certain materials foreign to the renal secretion, while they are passing through the gland-cells, so modify the process of secretion and of cell-growth, as to give rise to a desquamation of cells from the renal tubes. And this observation will suffice to show the probability that, in other cases, a like process of desquamation results from a similar cause, viz., an elimination of some morbid material by the renal cells. When, therefore, a patient has been exposed to one or more of the influences alluded to in the preceding chapter, as tending to produce a morbid condition of the blood, and when the urine presents the signs of the desquamative process occurring in the kidneys, there can be little doubt that this desquamation is the result of an effort to eliminate some of the abnormal materials, which have either been introduced into, or developed within the blood.

"The reader who has attended to the preceding detail of facts and inferences, will have no difficulty in perceiving their applicability to the pathological explanation of the morbid changes produced by desquamative nephritis.

"It is assumed, that the blood being in a morbid state, whether from the poison of scarlatina, or from any other of the various causes alluded to in the preceding chapter, an effort is made to eliminate the noxious matters by the secreting cells of the kidney. The cells, in striving to separate the strange materials, become modified in their action and nutrition, and being rapidly thrown off into the tubes, are then removed by the current of liquid, and appear in an entire form in the urine. Meanwhile the process of secretion is checked, and this, probably, in two ways. 1st. It is likely that when the cells are engaged in separating any new material, which so far modifies them as to lead to the process of desquamation, they perform their functions less rapidly and completely

than under ordinary circumstances, and, consequently, that the act of secretion receives a check from the moment that any material reaches the cells which requires this modified action—a retardation of the function of secretion which may be illustrated by the check given to the electric current, when, in one of the cells of a battery, materials having less affinity for each other are substituted for more active and efficient elements.

"2d. When the desquamative process has resulted, as it soon does, in the engorgement of many of the tubes with their accumulated contents, it is evident that in these tubes the process of cell growth and of secretion must be greatly retarded, if not entirely arrested.

"The next point to be observed is, that, together with impeded secretion, there is, as a necessary consequence, retarded circulation. This subject is fully discussed in connection with that of chronic inflammation of the kidney. In this place it will suffice to state, briefly, that the process of secretion being interfered with, in the manner already described, and the blood, consequently, being imperfectly purified and freed from its excrementitious matters, the circulation through the intertubular capillaries is impeded, and the vessels which lie behind these, in the course of the circulation—the Malpighian capillaries and the arteries—become distended. Serum now escapes freely from the gorged Malpighian capillaries, and mixing with the urine, renders it albuminous, while the coats of the vessels begin to assume the opaque and thickened appearance before alluded to. Together with the serum, there is a transudation of fibrinous material, which coagulates in the tubes, and entangling on its surface some of the desquamated epithelial cells, and thence it escapes with the urine, in the form of the epithelial casts which have been already described. Further, some of the over-distended Malpighian capillaries give way under the pressure to which they are subjected, and their contents escape into the tubes, some of the blood-corpuscles becoming entangled in the epithelial casts, and others being scattered through the urine, and contributing to form the dark-red sediment before described."

This is the form of renal albuminoecritic disease which takes place after attacks of scarlet fever, after common typhus, in acute dropsy, and after exposure to cold with errors in diet, and probably a considerable degree of intemperate living and irregular habits. At the same time, it must be allowed, that instances not unfrequently take place after thorough and continued exposure to cold and moisture, without previous irregular and intemperate habits, yet in persons in whom there has existed a long-continued state of susceptibility to the disease, which has thus been called into activity by the last exciting cause. The persons in which this mode of development is most frequently seen, are those of what is called the scrofulous habit. A mode of origin also not uncommonly observed is, when after an attack of scarlet fever, the patients are allowed to return too early to the use of animal food upon the idea of restoring strength. Instead of restoring strength, this mode of diet excites the vascular system, and especially the cortical texture of the kidney, while the skin is not yet in a condition to relieve the circulation by its secreting and excreting powers; and the result is an attack of acute desquamative nephritis.

The prognosis in this form of renal disease is upon the whole rather favourable. But much, if not all, depends upon judicious treatment. It is manifestly, in ordinary circumstances, a disease quite capable of cure. But to effect this, much attention to treatment, both medicinal and dietetic, is indispensably requisite.

[In the therapeutic treatment of the disease the chief objects to be held in view are, protection from cold; moderate, rather unstimulating diet; regular action of the bowels and of the skin; and, above all things, refraining from those stimulating remedies, diuretics, as these are in all instances dangerous. Iron may be given after inflammatory symptoms have disappeared. Examined by the microscope, fibrinous casts of the uriniferous tubes are to be considered pathognomonic of the disease; and from these being many or few the state and progress of the disease is to be judged.

The second form of these diseases is the *Chronic Desquamative Nephritis.* This is merely a chronic form of the last; sometimes it passes into it by imperceptible gradations, and sometimes without any of the marks of the acute form; and may therefore be gradually established without any of the phenomena of the acute disease taking place. The principal characteristic of this form is the long-continued shedding of epithelium, appearing in a more or less disintegrated state in the urine. The urine is for the most part albuminous, but variable in quantity and specific gravity.]

This disease is frequently a consequence of chronic gout, or of some kindred disorder in the general health. It gives rise to great changes in the blood, and several various constitutional disorders consequent upon these changes, among which the most frequent and important are anasarca and dropsy of one or more serous cavities, inflammation of the serous membranes, hypertrophy of the heart, with or without disease of the valves, and lastly organic changes or great functional disturbance in the nervous centres.

In one word, it may be said, either that this disease is a part and effect of chronic gout; or chronic gout and chronic desquamative nephritis are the joint offspring of the same morbid condition of the system.

The urine in this form of disease should be examined when it is not turbid with lithates. When voided it is quite clear, and remains so after standing a few hours. Then, however, it deposits a sediment, dense and white, which looks like fine dust at the bottom of the vessel. Under the microscope this is found to consist partly of a scattered amorphous material, partly of the same material, in the form of cylinders, which have evidently come from the renal tubes, and which the author proposes to denominate *granular casts.* This granular material the author regards as disintegrated epithelium, which has become detached from the basement membrane of the tubes, and subsequently washed out with the urine; some of it retaining the cylindrical form, while part is irregularly scattered.

The following account of the state of the urine in this disorder is given.

"In the next, more advanced, stage of the disease, the urine com-

monly presents the following characters. During the attack of gouty inflammation in the joints, the secretion is scanty, and its specific gravity rather high; it is also albuminous, and continues so for a variable period after the gouty paroxysm is over, the albumen gradually diminishing in quantity, and at length disappearing entirely, until the next attack of gout brings with it a reappearance of the albumen. A microscopic examination now shews that during the time when the urine is albuminous, there is a more abundant shedding of disintegrated epithelium than in the earlier stage of the disease; the granular casts being numerous, and forming a rather copious, dense, whitish precipitate at the bottom of the vessel. The casts diminish in number simultaneously with the decrease of albumen in the urine, but at this stage of the disease they seldom disappear entirely; traces of them remaining throughout the intervals between the paroxysms, even when there is no admixture of albumen with the urine. The casts are sometimes obscured by a deposit of uric acid, or urate of ammonia, which at this period continues to be excreted in considerable quantities during and after the attacks of gout. In the intervals of the paroxysms, the urine is commonly more abundant than in health, of lower specific gravity, and of a somewhat paler colour. I have already said that the albumen disappears, but that the granular casts remain, though they are much less abundant than during, and for sometime after, the gouty paroxysm, when the renal desquamation is more active.

"We have here a series of phenomena indicating more advanced and more permanent diseases in the kidney, than during that which I have described as the first stage. For, 1st., during the general derangement which accompanies and follows the attacks of gouty inflammation of the joints, the increased number of granular casts shews a more active desquamative process, and the albuminous condition of the urine is evidence of a more impeded circulation; and, 2d., during the intervals of the gouty paroxysms, the continued presence of the granular casts, though in diminished numbers, shews that the kidneys are constantly excreting some of the morbid matters with which the system is becoming saturated, and of which the so-called 'chalky' deposits, which now often begin to form in the joints and elsewhere, afford one kind of evidence."

[Essentially this disease is an atrophy of the kidney. If the chronic desquamation is progressive the result is atrophy of the tubes; if the disease is stayed after a certain number only of the tubes is denuded, such a condition is favourable to their conversion into cysts. The wasting of the kidney is produced by the exfoliation of the broken up cells and the disintegration of the epithelium.]

Dr. Johnson gives a just view of the prognosis in this disease, and the treatment to be pursued. The main objects in treatment are to reduce the rate of diet to the exigencies of the system; to restrict and regulate the amount of food to be taken; to amend the action of the skin by suitable clothing, the use of the warm bath, protection from cold, and removal, if need be, to a dry, rather warm climate; to abate the congestive and inflammatory state of the kidneys by occasional local bloodletting by means of cupping, and by revulsion by means of frequent

blisters, or the use of the seton. The author is averse to the use of blisters and the employment of liniments containing turpentine, from the apprehension that they may irritate the tubular and calycine part of the kidney. An easy method to obviate the bad effects of the eantharides of the blister is to keep it applied only five hours, and then apply over the surfaee a cloth well covered with resinous ointment.

[The third form is what Dr. Johnson has termed *waxy degeneration of the kidney.* The discharge by the urine of waxy casts, varying in size, is the characteristie symptom of this form. All the cases in which Dr. Johnson observed these casts, along with epithelial casts, recovered, but]

From all that is stated concerning this condition of the urine, it appears hitherto very doubtful whether it ought to be regarded as indicating the existence of a distinct, substantial, and essential disease of the kidney.

[The fourth form of these renal diseases is the *Non-desquamative Disease of the Kidney.* Here the objeet of this morbid action is the elimination of certain abnormal products of the blood; so that in this form also, the state of the kidney is one of congestion and inflammation, but without exfoliation of the epithelium taking plaee.]

So far as we understand the train of reasoning adopted by the author, it amounts to this: Non-desquamative disease of the kidney, congestive or inflammatory,—for in our opinion positive inflammation is not neeessary to eonstitute any one of these morbid states,—is a very dangerous and serious disorder; in so far as it shows, that the noxious matter presumed to lurk in the eireulation is not eliminated, at least not freely eliminated. The oceurrenee of small casts which takes plaee in this form of disease, and the presenee of albuminous urine, show that an effort is made to get rid of some noxious matter; but as no epithelial scales are observed, this proves that no desquamation or exfoliation takes place, and when this is the case, the diseharge of the hurtful matters is less free and perfeet than is requisite for the exigencies of the system.

[Lastly, we come to *Fatty Degeneration of the Kidney.* Of this there are two varieties—granular fatty kidney and mottled fatty kidney. These are ineluded under the term steatotis, now known under various terms, sueh as granular degeneration, mottled kidney, Bright's disease, &c. For information upon these forms we must, however, refer the reader to the next article, and to the previous volumes.]—*Edinburgh Med. and Surgical Journal, April* 1853, *p.* 436.

39.—ON BRIGHT'S DISEASE OF THE KIDNEY.

By Dr. George Johnson.

[We present to our readers in this paper the views of this eminent writer; for though professing to be a review of several foreign works, it is in reality an interesting and short monograph on this subject, by Dr. Johnson. First of the morbid change in the kidney:]

The following is the order of phenomena as interpreted by Reinhardt and Frerichs: an engorgement of the renal blood-vessels, an effusion of inflammatory products, a more or less complete and general metamorphosis of these products into fat, and finally atrophy and wasting of the kidney. The small contracted granular kidneys have once been fat: the large, pale, fat kidneys are in continual progress towards atrophy and contraction.

[In answer to this definition of Bright's disease, Dr. Johnson remarks:]

The first observation which we have to make, with reference to this systematized description of renal disease, is, that there is no proof whatever that hyperæmia or over-fulness of the blood-vessels, is either a cause or an antecedent of those exudations into the uriniferous tubes, which constitute an essential feature of the inflammatory forms of renal disease. We refer now to the rapid formation of epithelium within the convoluted tubes, and to the occasional replacement of the normal epithelium by puriform cells. These changes in the tubes, it is true, are accompanied by engorgement of the blood-vessels, and the phenomena occur almost, if not quite, simultaneously; but in the order of causation, the changes in the secreting cells stand first. The circulation is impeded in consequence of morbid changes primarily affecting the secreting cells, and retarding their functions. Engorgement of blood-vessels implies, not an increased afflux of blood, or a more rapid circulation, but a retarded and impeded circulation, the impediment being shown by the frequent occurrence of hemorrhage from the Malpighian capillaries in the early stages of acute renal disease, and by tortuosity of the arteries, with great hypertrophy of their muscular coats, after long-continued morbid changes affecting the secreting cells.

The theory of the *oneness* of Bright's disease has apparently had its influence in leading our authors to overlook the importance of distinguishing the various kinds of exudation into the tubes, which occur during the inflammatory forms or stages of the disease. If these varieties of morbid products were appreciable only after the death of the patient, their distinction would have little practical value; a moderate amount of clinical observation, however, will show, first, that the precise nature of the pathological changes which are occurring in the kidney may, with few exceptions, be as readily detected by a microscopical and chemical examination of the urine during life, as by the most searching *post-mortem* inspection of the kidneys; and, secondly, that the various kinds of products observed in the urine have a widely different significance when viewed in relation to prognosis. With reference to this point, it is of the first importance to ascertain, in any case of recent acute albuminuria, whether the urine is clear and free from sediment, or whether it deposits morbid materials, and what is the nature of these materials—whether there are any forms of tube-casts, and what is their appearance—are they composed of blood or of pure fibrin? or do they entangle organic cells of any kind, and what is the nature of these cells? have they the character of renal gland-cells; and do they contain oil, or are they free from that material? or, lastly, do they more nearly resemble pus-corpuscles?

[The microscopical examination of the urine during the patient's lifetime is of the greatest importance in investigating the disease. In the inflammatory stages, in a large proportion of cases, renal gland cells are entangled in the fibrinous materials of the casts; and in other instances the casts are transparent and homogeneous, apparently being composed of pure fibrine, larger, and without entangled epithelial cells. The latter ones have been formed in those tubes which possess *no* epithelial lining; the former and smaller have been moulded in tubes which possess the epithelial lining complete.]

The Stage of Fatty Degeneration.—In considering the subject of fatty degeneration of the kidney, it is very important to bear in mind that the morbid condition occurs in two distinct forms. The large *granular fat kidney,* which is represented in the third figure of Dr. Bright's third plate, is, in a large proportion of cases, a secondary condition, which has been preceded for a longer or shorter period by an inflammatory state of the organ. We have observed the approach of this form of disease under the following circumstances:

1. An acute attack of general dropsy, with scanty high-coloured, albuminous, and bloody urine, and an abundant desquamation of epithelium, is followed, after a period of three or four weeks, by an appearance of oil in some of the cells; and as the disease makes progress, the total amount of epithelium in the urine diminishes, while the proportion of the cells which contain oil is increased, until at length nearly all the cells are more or less distended with oil, many of the cells, as well as scattered oil-globules, being entangled in small transparent wax-like casts. After death the kidneys are found enlarged, the cortical substance pale, and having scattered through it the characteristic yellow granulations, which very much resemble the minute atheromatous spots which are often seen in the arteries. These granulations are found, on microscopical examination, to be composed of convoluted tubes distended with oil, which is partly free and partly contained in cells. In other tubes the epithelium appears opaque, but contains no oil, and the central canal is free from deposit, while in others again there is an accumulation of epithelium, or a fibrinous effusion, or both combined.

2. In other cases the approach of fatty degeneration is different. The disease is chronic from the commencement; the urine is highly albuminous, but frequently of the natural colour, and either free from sediment, or it deposits a light cloud, which contains some of the small transparent waxy casts before mentioned. After a period, which may vary from a few weeks to many months, these casts entangle oil partly in the form of scattered globules, and partly contained in cells. The oily casts and cells continue until the fatal termination, and after death the kidneys present essentially the same appearances as in the cases last mentioned.

The second form of fatty degeneration of the kidney differs in many important particulars from the preceding. The kidney is enlarged, but the cortical substance wants the granulations which are characteristic of the first-mentioned form, and it has instead a mottled appearance. On a microscopical examination *all* the tubes of the cortical substance are found to contain an excessive quantity of oil, which is, for the most part,

contained within their epithelial cells. This condition of the kidney is sometimes found both in the human subject and in the lower animals—in cats and in dogs—unconnected with albuminuria, or with other functional symptoms of renal disease; while in other cases of dropsy, with albumen and oil in the urine, this mottled form of fatty degeneration has been the only anatomical change observable in the kidneys after death. It will be seen, therefore, that the two forms of fatty degeneration differ in these important particulars: 1st. that in the granular form of disease the fatty degeneration is partial, while in the mottled form it is general throughout the tubes of the cortical substance; 2nd. that in the first form of disease, albuminuria and what may be considered an inflammatory stage precede, sometimes for a considerable period, the signs of fatty degeneration, while in the second form a great degree of fatty degeneration may exist unassociated with an albuminous condition of the urine.

The stage of Atrophy.—We come now to the consideration of that condition of the kidney, the most remarkable outward feature of which is a diminution of size and weight. The atrophy affects primarily the cortical substance, the surface of the kidney usually becomes uneven and coarsely granular, and its vascularity is much diminished. The first and second figures in Dr. Bright's third plate are probably familiar to most of our readers.

We have already stated that Reinhardt and Frerichs agree in considering that these small granular kidneys have passed through the stage of fatty degeneration, and that atrophy of the gland is only a later stage of the same morbid process as that of which inflammatory effusion and fatty degeneration constitute the first and second stages. In this opinion Eisenmann and Mazonn also concur, although they differ from Reinhardt and Frerichs in respect to some points of less importance. Now, with reference to this question, we dissent entirely from the opinions of these pathologists. True it is that a careful and extended series of observations upon morbid urine and kidneys had led us to form a judgment upon the point in question before we had any knowledge of the opinions referred to, but we trust that we were not, on that account, less open to conviction by any evidence which might be adduced to prove the transition from fatty degeneration of the kidney to that contracted condition of the organ with which every pathologist is familiar. But as we have met with no such evidence in the course of our own study of morbid phenomena, so we find none in the writings to which we have access. None of our authors attempt to prove the transition in question by clinical observation of the urine, but their opinion appears to be based upon what they consider the various stages of morbid change in the kidneys, as determined by *post-mortem* examination.

Our limits will permit us to indicate only some of the principal facts, which tend to prove, as we think incontestably, that the large granular fat kidney and the small contracted kidney are the result of two morbid processes as essentially diverse as is consistent with the fact of the two diseases affecting the same tissues.

The most characteristic feature of that form of disease which leads to atrophy of the kidney is a disintegration of the epithelial cells, which

appear in the urine in the form of granular casts of the tubes. In consequence of this washing away of disintegrated epithelium from the tubes, the basement-membrane is left denuded, and subsequently the tubes, having lost their epithelial lining, either waste away entirely, or, as we believe, they may continue to secrete a serous liquid, and so become dilated into cysts. In consequence of the atrophy of the tubes, the meshes of the matrix, in which the tubes are packed, become narrowed, and the fibres appear relatively thicker. Frerichs describes a development of new fibrous tissue as an occasional occurrence, and Mazonn considers it to be a constant and a characteristic condition. As Frerichs doubts the very existence of the normal fibrous matrix, his evidence upon this point is of little value to those who believe in the existence of such a tissue. Mazonn recognises the normal intertubular tissue, and believes that he can distinguish this from the newly-formed fibres which are the product of disease.

A very few of the tubes may usually be found to contain oily matter, and this occurs more frequently in the denuded tubes than in those which still retain their epithelial lining. The thickening, and finally the obliteration, of the Malpighian capillaries, and the hypertrophy of the arterial coats, occur in this as in all forms of chronic renal disease.

The points of contrast between the fat granular kidney and the contracted granular kidney are chiefly in respect of the tubes, with their epithelial lining. In the contracted kidney the disintegrated epithelium is swept away in the form of granular casts, and the tubes thus left denuded either waste or grow into cysts. In the fat kidney, the epithelium, for the most part, retains its position, and undergoes fatty degeneration, the tubes neither become denuded nor waste, as in the contracted kidneys, nor do they, except in very rare instances, grow into cysts. The combination, in the same subject, of the characters of the fat and the contracted kidney, are so rare as to prove that, while the two forms of disease are not absolutely incompatible, they are by no means allied; indeed, their relation is rather one of antagonism, since, in the one case, the epithelium is disintegrated and swept away, while in the other it remains, and undergoes fatty transformation.

That the fat kidney has no tendency to pass into the contracted one, is shown by the *post-mortem* examination of cases which have been for a long time under observation. Not long since we examined the kidney of a man who had been nearly four years ill. He first had dropsy in the autumn of 1848: the urine was highly albuminous, and contained only casts and cells in November, 1849, the same in January, 1850, and again in December, 1851; after that we have no note of the urine. He died in March of the present year (1852). One kidney had been destroyed by a calculus in the ureter, the other was more than double the natural size and weight, and had all the characters of a granular fat kidney, but not a trace of denuded or atrophied tubes. In another case, which had been nine months under observation, the urine, from first to last, contained oily casts and cells. The kidneys were much enlarged, and presented all the characters of fatty degeneration, but not a trace of the process which leads to atrophy.

But the essential difference between the two forms of disease may be

proved by evidence of another kind, which may appear more conclusive to some of our readers who, perhaps, have less confidence than ourselves in the results of microscopical observation. The chronic desquamative disease which causes the disintegration and destruction of the epithelium, and finally extreme wasting of the kidney, is in many cases one of the most insidious of maladies, and it may proceed to the extent of destroying a large portion of the epithelium of the kidney without the occurrence of dropsy or any other formidable symptom; when perhaps, suddenly, in consequence of some accidental cause, the most urgent symptoms of suppressed secretion arise, the patient soon dies, and the kidneys are found wasted, and many of their tubes denuded and atrophied. We have before us the notes of four such cases; one patient was suddenly seized with peritonitis, and died in a few hours, a second died with apoplectic symptoms, a third with delirium and epilepsy, and a fourth with obstinate vomiting, consequent upon suppression of urine. The first two patients were supposed to be in good health until the period of their sudden seizure. In the last case alone had there been any dropsical symptoms, and these were only very slight and transient. In all the cases the kidneys were in an advanced stage of that chronic form of disease which is characterized by denuded and atrophied tubes. In contrast with these cases, which are by no means rare, we place the fact, that, according to our experience, the *granular form* of fat kidney *never* destroys life without the previous occurrence of dropsy, which is usually one of the most prominent and distressing symptoms. Again, we have very rarely met with a case of inflammatory disease of the kidney—such as Reinhardt and Frerichs agree in referring to the first stage of Bright's disease—unaccompanied with dropsy in some degree, and for a variable period. Now, according to the opinion of these pathologists, the kidneys of the four patients whose cases we have briefly mentioned, must have passed through an inflammatory stage, and a stage of fatty degeneration, before they finally arrived at the stage of atrophy; yet in three of the cases there had been no dropsy whatsoever, and in the fourth case a slight and transient œdema of the ankles—such as might occur in any debilitated subject—had formed the only dropsical symptom. This supposition is so improbable that we should hesitate to admit the doctrine which is based upon it, even without what we consider the conclusive evidence of the minute structural changes in the kidneys. We therefore feel bound to dissent from the doctrine of the oneness of Bright's disease, as propounded by Reinhardt and Frerichs. The apparent simplicity of the doctrine is not in accordance with nature, and it therefore tends to cause confusion. While we recognise an inflammatory form of the disease, we must, for the purposes of diagnosis and prognosis, distinguish between the various kinds of effused products, which are chiefly, besides serum and blood, epithelium, pus, and pure unorganized fibrin. We must distinguish the granular form of fat kidney, which may be a consequence of a previous inflammatory stage, from the mottled form of the disease, which is analogous to ordinary fatty degeneration of the liver, and not a consequence of inflammation. Finally, we must recognise the fact, that the small contracted kidney, although an occasional consequence of an acute inflammatory attack, is more commonly

the result of a disease which is chronic from the commencement, and never, as we believe, a consequence or a later stage of either of the forms of fatty degeneration.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 57.

40.—*Phosphate of Lime in Oxaluria.* By Dr. Küchenmeister.—The author suffered for four years from chronic diarrhœa, and other disorders of the digestive organs, accompanied with marked emaciation and hypochondriasis. The urine was acid, and very rich in crystals of oxalate of lime; specific gravity, 4·5—5·0. There was no apparent cause for the symptoms. Upon Beneke's advice, the author took daily, lactate of iron, gr. ss.; phosphate of lime, grs. ii.—iii.; carbonate of lime, grs. iv.—vi. After eighty powders, the evacuations became regular, the appetite and the general aspect improved, the oxalic crystals disappeared, and the specific gravity became 2·0—2·5.—*Med. Times and Gazette, April* 16, 1853, *p.* 404.

41.—ON THE NATURE AND TREATMENT OF DIABETES MELLITUS, OR GLUCOSURIA.

By M. Bouchardat.

[The following abstract upon this subject is taken from the review of an article in the memoirs of the French Academy, 1852.]

By the plan which M. Bouchardat now recommends to our notice, in its full detail, he declares that he can cure the majority of cases of diabetes—his test of cure being not only present removal of the sugar from the urine, but the ability of the patient to employ feculent aliments without its reproduction. He, however, requires the intelligent co-operation of his patient, and, above all, the frequent testing of the urine, by the patient himself, as a means of ascertaining progress and guarding against relapse. The means chiefly to be relied upon are those of a hygienic character; and at all events, the power of these should be exclusively ascertained at first, before resorting to any medicinal agents.

1. *Diet.*—As long as the urine exhibits sugar, all feculent and saccharine aliments must be entirely excluded; but the patient need not be confined to what is called an exclusively flesh diet, although this, when not repugnant to him, is the best. Every description of meat, dressed with the usual sauces and seasonings, (to the exclusion of flour, however), may be employed; and for those who can get over the prejudice against it, the flesh of *carnivorous* animals, M. Bouchardat says, is best. By proper management (and what cannot a French cook do?) that of the cat or fox becomes a highly relished viand. Several poor patients, who otherwise would have been unable to procure a flesh diet, have resorted to this means with advantage. Fish, in all its numerous varieties, forms a valuable resource for both rich and poor, and may be eaten with abundance of oil and a moderate quantity of vinegar. Eggs, again, so susceptible of varied modes of preparation, are excellent; and although

milk is forbidden, good fresh cream and all kinds of cheese are allowed. Except in extreme cases, green vegetables and salads, although they contain some sugar, starch, or gum, may be taken in moderate quantities; but abundance of oil, or the yolk of eggs, should be conjoined. For such patients who cannot well overcome their liking for bread and other feculents, M. Bouchardat has, during the last ten years, had prepared a bread of flour containing 70 per cent of gluten.

As the prohibited feculent and saccharine bodies belong to the respiratory group of alimentary substances, we have to choose others from the same group; and those best calculated to supply their places are fatty bodies and alcoholic drinks. Among the latter, Bordeaux wine occupies a prominent place, as much as from one to two *litres* (from two to four pints) being admissible *per diem*, which, at ten per cent. of alcohol, would supply about 150 *grammes* ($2\frac{3}{4}$ oz.) of this substance in the 24 hours. Fatty bodies must not be given too exclusively, lest they excite disgust, but mingled with other aliments, from 150 to 200 *grammes* being required, in addition to the alcohol. Beer is objectionable. from containing dextrine. Coffee, drunk without milk or sugar, and to which a little rum, cream, or brandy may be added, is a good drink. To relieve thirst, Seltzer, Spa, Vichy, or soda water may be taken; but acid drinks, so keenly desired by the patients, are very objectionable. The patient should always eat and drink in moderate quantities, slowly masticating his food. This practice tends to the relief of the attendant dyspepsia, and to assist the distended stomach to return to its normal dimensions. A flannel bandage applied around the epigastrium contributes to the same end.

2. *Clothing.*—As chills operate very injuriously on these patients, warm flannel clothing forms a valuable protective agent, and beneficially excites the languishing functions of the skin. Indeed some medicinal agents are of no avail unless aided by complete flannel clothing, which maintains diaphoresis. General frictions are very useful, and a moist warmth of the feet should be maintained.

3. *Exercise.*—To recommend this indiscriminately would be injudicious, for many patients are too feeble to undertake it. But when their strength has become somewhat recruited by regimen, walking, gymnastics, agricultural labour, &c., much expedite the cure, and are found, as recovery is approaching, to enable the feculent aliments to become utilized by the system.

4. *Pharmaceutical Agents.*—M. Bouchardat entertains a high opinion of the utility of *carbonate of ammonia* (from 5 to 15 *grammes*—77 to 230 grains in the twenty-four hours), providing flannel clothing be worn. Other *alkalies* suffice for slighter cases, when the urine contains uric acid as well as glucose. Employed consentaneously with out-of-door exercise, they seem to exert great influence in preventing the reappearance of sugar in the urine, when feculent aliments are resumed. *Opiates*, if given alone, are mere palliatives; but when conjoined with other remedies, and in moderate doses, so as to act on the skin, they are very valuable. M. Bouchardat sometimes prescribes Dover's powder, but prefers the old theriaca before all other preparations, without defending the absurd complexity of its composition.

In severe cases of glucosuria, then, diet, exercise, and flannel clothing constitute the basis of treatment, carbonate of ammonia and opiates best aiding their action. Other remedies have their occasional uses, such as iron, tonics, chloride of sodium, and antiscorbutic plants. M. Bouchardat often employs emetics at the commencement, and endeavours to modify the disturbed functions of the liver by aperients, of which ox-gall with rhubarb the best.

Circumstances influencing the effects of Treatment.—Foremost among the *favourable* indications in a case is the *rapid return of the urine to a normal state,* which may take place in from 24 to 48 hours after the feculents have been excluded. The *recent date of the affection* is another highly favourable circumstance; and because it is so, M. Bouchardat urges testing the urine whenever the slightest suspicion can be held, and for the detection of relapses, which are frequent and insidious. Other favourable circumstances are the retention of considerable *embonpoint,* the easy circumstances of the patient, and his being in possession of great perseverance.

The *unfavourable* circumstances are the reverse of the above; but negligence is still worse than poverty, as the poor man has some resources. The treatment of the case is usually ill managed in *hospitals,* owing to the vitiated air, the absence of exercise, the sameness of diet, and the insufficiency of surveillance. The existence of a great *appetite* is a common and not unfavourable circumstance, requiring only moderation in its gratification, at meals not too far separated. *Want of appetite* is a far more unfavourable sign, which should be actively combated. M. Bouchardat has found small doses of rhubarb, and exercise in the open air, of advantage. *Obstinate constipation,* resisting the most varied purgatives, is a bad complication, indicating disease of long duration, which has produced important modifications in the condition of the alimentary canal. Fatty substances, combined with matters which leave residue, as spinach and gluten-bread with bran, are here indicated. *Cold and damp air* is unfavourable to diabetic patients; but M. Bouchardat has had patients from Algeria, and has not derived advantage from sending others to Italy. M. Bouchardat agrees with Dr. Prout in considering the appearance of *albumen* in the urine, which is often met with, as an unfavourable occurrence. The prognosis of saccharine albuminuria is not so serious as is that of simple chronic albuminuria. The frequency of the occurrence of *phthisis* in cases of glucosuria is familiarly known. In all the autopsies the author has made, when the patient has not been cut off by an intercurrent affection, tubercles have been found in the lungs; and he feels convinced that many cases of phthisis have had their origin in a glucosuria that has been overlooked, and which might have easily been removed. In severe and old cases of glucosuria, *vision* is always found more or less enfeebled; but in most cases, when not of old date, as the condition of the patient has improved under appropriate regimen, this amaurosis has subsided. When, indeed, this is not the case, the prognosis of the glucosuria is serious; and it will often be found complicated with albuminuria. *Impotence,* more or less decided, is another effect of glucosuria; but in young subjects the generative functions resume their power when the

original disease is rationally treated. Glucosuria may occur at any *age*, from infancy to senility; M. Bouchardat having met with most cases between forty and fifty. He has met with none between eighteen and twenty-five. Old age does not constitute an obstacle to cure; but so difficult is it to watch over children, that the author is not aware of a sustained cure prior to fifteen years of age. He has met with more male than female patients.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 141.

42.—PERMANGANATE OF POTASH IN DIABETES.

By George Sampson, Esq.

[Mr. Sampson remarks, that in some cases of diabetes—long after the sugar has disappeared from the urine—the quantity of the urine remains too abundant, and its specific gravity too low. He has attributed this to imperfect action of the digestive and assimilative functions. To remedy this, Mr. Sampson sought some remedy which would give out oxygen, when taken into the stomach. Chlorate of potash having failed, the permanganate was tried; speaking of which, Mr. Sampson says,]

I have found this medicine of essential service in several cases of obstinate dyspepsia, especially when there existed a profuse flow of urine; its effect in speedily diminishing the quantity of that secretion has been strikingly marked, and has usually been followed by improvement in the general health.

The following case is also calculated to show that the permanganate of potash possesses powers which deserve to be thoroughly investigated:—

A gentleman, upwards of sixty years of age, residing in the country, had for several months been suffering from confirmed diabetes mellitus when I first saw him, two years and a half ago. In the course of the twenty-four hours he passed from ten to twelve pints of urine, the specific gravity of which was 1·035 in the morning, and 1·040 in the evening. The patient was greatly emaciated, and he suffered severely from constant pains in the back and thighs, and from increasing debility. After he had perseveringly tried various remedies for nine or ten months without deriving any benefit, I began, in August, 1850, to give him the permanganate of potash in solution, in doses of two grains, which were afterwards increased to three grains three times a day. In the course of a few days a visible improvement took place; he felt better; the quantity of urine began to diminish, and the thirst became less troublesome. These favourable symptoms were soon followed by some return of appetite, and a gradual increase of strength. This amendment went on without interruption; the medicine was continued for three months, until the following November, when all medical treatment was discontinued, as the patient felt quite well, and the urine was reduced to its natural amount. A remarkable fact, must, however, be mentioned, that at that time, notwithstanding the restoration of the general health, the urine still contained a considerable quantity of sugar. I am not aware whether this state still exists, but the patient's report to me a few days since ran thus:—"I pass less than a pint of urine

during the night, somewhat more during the day; the pains are gone, and I can walk a fair distance without fatigue."

The dose of permanganate of potash which I have generally found to agree best with the stomach, is from one to three grains in solution, and it should be given in three or four tablespoonfuls of water, three times a day, shortly before meals.—*Lancet, Jan.* 8, 1853, *p.* 42.

[The following remarks by Mr. Sampson are supplementary to the above statement. He says,]

In that communication I specified two or three grains of that salt as the dose which appeared to agree best with the stomach; but I have since ascertained that a larger quantity may generally be administered without inconvenience. For instance, a patient, for some months past afflicted with diabetes, commenced the use of the permanganate, six weeks since, in doses of two grains; but he is now taking eleven grains three times a day, and is rapidly advancing towards recovery.

There is, however, considerable diversity in the tolerance of the medicine evinced by different individuals. In two patients, for example, suffering from dyspepsia, it became necessary to restrict the dose, nausea being produced, in one instance, by nine grains, and in the other by six grains of the salt.

My experience leads me to the conclusion that the best plan is to begin with two or three grains three times a day, and to add one grain to each dose every third day, unless it be found to disagree.

The effect of the permanganate is remarkable in speedily removing the thirst from which diabetic patients usually suffer so much; and although during the use of the remedy a brown fur is sometimes formed on the tongue, this appearance is not accompanied with dryness of the surface, and is not therefore to be regarded as an objection to the continuance of the medicine.—*Lancet, Feb.* 19, 1853, *p.* 189.

43.—*Strychnine in Incontinence of Urine.* By Dr. Panel.—A man suffered from incontinence of urine for five months, in consequence of paralysis of the neck of the bladder, brought on by being disturbed in micturition. The urine flowed from him in drops. After the fruitless administration of strychnine internally, a solution was injected into the bladder (0·50 centig. of strychnine to 500 centig. of water). The patient recovered in thirteen days.—*Journal de Bord.—Med. Times and Gazette, Feb.* 5, 1853, *p.* 147.

SURGERY.

AFFECTIONS OF THE BONES AND JOINTS.

44.—ON THE TREATMENT OF FRACTURES OF THE FEMUR BY A SIMPLE MODIFICATION OF LISTON'S SPLINT.

By R. G. H. Butcher, Esq., Surgeon to Mercer's Hospital, Dublin.

[Many and various have been the methods adopted for the treatment of cases of fracture of the femur. The plan of Mr. Pott,—that of placing the patient on his side, and bending the thigh on the pelvis, and the leg on the thigh,—is now repudiated by most surgeons. The principle in the cumbersome machines of Desault and Boyer, with their numerous additions and improvements, was a correct one, viz., that of maintaining permanent extension. The apparatus of Josse, Meyer's machine, Physick and Houston's apparatus, as well as that of Alban, were all intended to carry out the same intention. Mr. Butcher, however, observes,]

Of all methods of treatment, that by the simple contrivance of Liston, modified, as I shall presently notice, is the most comfortable to the patient, preventing eversion, shortening, and deformity; and the mechanism is so applied, that the trunk, pelvis, thigh, leg, and foot constitute one rigid body, which may be moved entire, but the component parts of which being immovable, *inter se*, preserve the same mutual relation. I have proved the advantages accruing from the appliance of this splint in every form of fracture to which the thigh bone is liable from without the capsule to the lowest part of its shaft. And, had I wished to transgress the bounds which I have marked out for myself in this paper, I could easily have given cases where it proved of most essential service in steadying the parts in fracture of the cervix femoris occurring in old subjects; as also in soothing and allaying the spasms consequent upon ulceration occurring in the cartilages of the knee and hip joints.

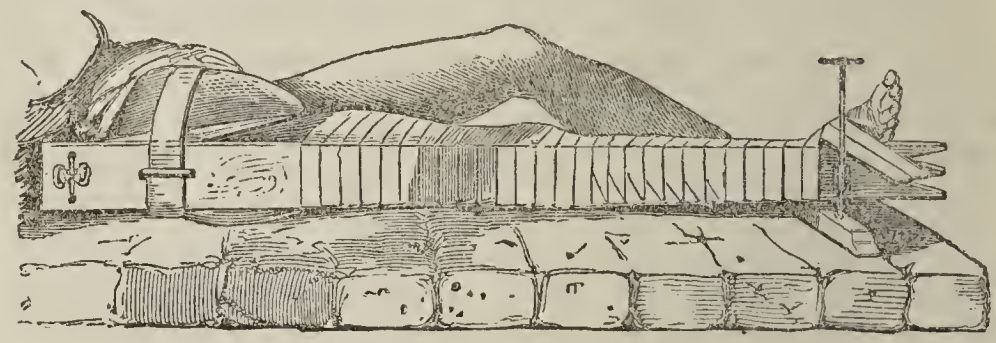
Liston gives the following description of his splint, and directions for its application:—"The apparatus consists of a plain deal board, of a hand's breadth for an adult, and sufficiently strong; narrower and slighter, of course, for young patients. It is made to suit the particular subject of the injury, to extend from opposite the nipple to three, four, or five inches beyond the sole of the foot. It is perforated at the upper end by two large holes, and provided with two deep notches at its other extremity; a sufficient hollow or perforation is made opposite the malleolus. A pad of corresponding length and breadth is attached by a few

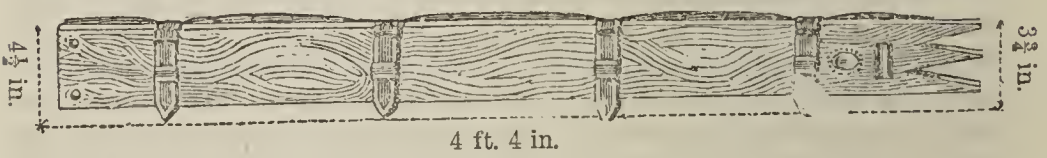
pieces of tape; a roller is split at the end, and having been tied through the openings in the top part of the splint, is unrolled so far, and fixed for a time to the lower end of the pad. Reduction having been effected by a little gentle and continued extension of the limb, while the pelvis is fixed, the position is preserved by an assistant placing one hand over the dorsum of the foot, and the other upon the knee; a narrow roller is applied from the toes to a little below the site of the fracture, with a moderate degree of tightness, to prevent infiltration of the limb, in consequence of pressure by the perineal band, which is now placed under the patient: it consists of a large soft handkerchief or shawl, containing the necessary quantity of tow or wadding, and covered with oiled silk. The splint is then laid along the outside of the limb, and the roller already spoken of is passed under the sole of the foot, and turned round the ankle and heel. These parts are previously thickly padded with tow, cotton, wool, or wadding, to prevent the painful effects of pressure, as upon them the resistance to the extension principally falls. The roller is carried repeatedly through the notches in the end of the splint, as it is crossed over the dorsum of the foot, and ultimately turned round the limb to near the groin. The object in pursuing this plan must be apparent: by the attachment of the end of the roller, and its subsequent arrangement, the apparatus is prevented from slipping upwards, and is made, as it were, of a piece with the limb. The ends of the perineal band are passed through the perforations, drawn with moderate tightness, and firmly tied; and a few turns of a broad bandage round the pelvis and chest complete the proceeding."

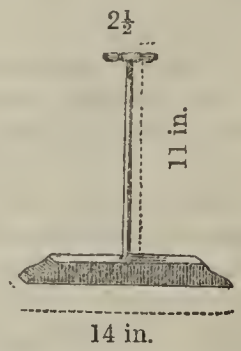
Numerous disadvantages are laid down by writers, as resulting from the use of Liston's splint. It is stated that permanent eversion is likely to occur; that inversion of the foot, knee, and lower fragment may take place, the result of rotatory displacement; that much of the force necessary for extension is lost, owing to the obliquity of the counter-extending belt; that the ankle and groin are likely to suffer from pressure; that the pressure made across the groin causes great œdema of the whole limb, in consequence of the obstruction which is caused to the circulation in the inguinal veins and absorbents; and lastly, the objection made by Earle, that the limb being bound to a perfectly straight body, placed at the outside of the thigh, and considerable pressure made on the inner side of the knee in fractures of the shaft of the bone, tends to destroy the natural obliquity of that part, and bring it more into a straight line, which he states is not only destructive to the symmetry of the limb, but impedes progression, and renders the erect posture less secure. No doubt some of these untoward results arise from an inefficiency in the splint to accomplish all that is required, while others are created by its not being properly adjusted. To remedy these defects, I offer to the profession a modification of the splint, that which I have been in the habit of using, and, as proved by the foregoing cases, with the very best results. I am happy to say it has met with the warm approval of my colleague, Mr. Tagert.

The alteration is very simple, and consists in the addition of a piece of wood placed in a transverse direction beneath the lower end of the splint, and upon which its edge rests. The splint is steadied in this

position by means of a long screw conveyed through a socket rivetted vertically on the side of the splint. The upper end of the screw has fitted to it a brass handle placed across, while the lower end terminates in a cylinder which is received into the centre of the piece of wood, and fastened in a hollow beneath by means of a nut and washer. The cylinder, as contrasted with the screw, is somewhat contracted, and presents at its commencement a shoulder which rests upon the steel plate on the upper surface of the transverse piece of wood, while the remainder moves freely in the tube for its reception. From this it must follow that, by a few turns of the screw, the splint may be elevated or depressed at pleasure. Another advantage resulting from this mechanism is, the facility with which the splint can be reversed, the screw changed, and its adaptation to either limb effected.







The plate shows the proportions to be observed in the form of the splint. It may be made of seasoned pine; its length, as will be seen presently, must be in accordance with the height of the patient. The length of that represented in the drawing measures four feet four inches; the widest part at its upper end being four inches and a half, which gradually diminish downwards to three inches and three-quarters opposite the ankle. It is eight lines thick, and is deeply notched at the lower end to the depth of four inches; while it is pierced at the upper by two circular holes, two inches and a half apart. There is cut in the lower end of the splint, corresponding to the outer ankle, an oval aperture, the centre of which is eight inches and a half from its extremity; and the socket for the screw is placed midway between its circumference and the acute angles formed by the notches. The length of the transverse piece of wood is fourteen inches; its breadth two inches and a half, and its depth two inches. The height of the screw above it measures eleven inches; and the length of the cross handle two inches and a half.

A long cushion, somewhat wider than the splint, is applied to its inner surface, and extends from the apertures above to a point opposite the attachment of the screw. This cushion is retained in position by four straps and buckles; it is stuffed with horse-hair, and perforated for the reception of the ankle. The corresponding hole in the splint has tacked into it a pad, softly filled with a like material, and covered with chamois leather.

The application of the apparatus, modified as I have described, is almost exactly in accordance with the directions given by Liston,—the screw and transverse piece of wood being detached, the splint is applied nearly in a similar manner; there are, however, some cautions to be observed in its adjustment which he has not adverted to, yet a strict observance of which I consider absolutely essential, that the same satisfactory results may be obtained as followed in the embarrassing cases that I have detailed.

First, as to the preparation of the splint, and the guarding of the ankle from pressure. It has been stated that the splint is perforated, and has, adapted to the aperture, a soft chamois cushion; that a suitable pad extends along its inner surface, with a similar opening for the reception of the outer malleolus; but this is not enough; there is also an additional pad, of variable thickness, required to lie between the outer surface of the knee and the padded splint; or, in other words, to fill up the space between them occasioned by the natural obliquity of the thigh bone, this, of course, from the breadth of the pelvis, greater in women than in men. The next point is, that the limb should be drawn down to its full length, the broken bones co-apted and retained so by assistants, the ankle, heel, and dorsum of the foot rolled with soft wadding, the depression above the outer malleolus obliterated by additional folds of it, and the entire supported with a roller neatly applied from the toes to above the knee; then the ankle may be lashed to the splint, the surgeon taking good care that the turns of the bandage be even above the ankle, and secure the heel closely to the splint; if this be correctly done, eversion of the foot will be prevented. The ankle being thus fixed, and extension at the same time fully kept up, the perineal band is to be applied; this lac must be made of soft material and well stuffed, at the same time that a strong piece of tape is stitched along its entire extent, from one end to the other, to prevent its yielding; in its application care should be taken that it lies evenly up against the ramus of the ischium and pubis, that when the ends are brought through the holes at the upper part of the splint to be tied, they may be drawn on with an equal force; because otherwise the integuments will be wrinkled, and quickly excite much irritation. Until the lac is tied the required extension should be kept up by an assistant at the ankle, so as to obviate the reprehensible practice of thrusting the splint with the lower part of the limb downwards; for if this manœuvre be employed, the folds of the bandage connecting the splint to the ankle are more or less altered in their direction: they no longer lie even, their upper edges constrict the part, and the skin is unevenly strained; if so, it soon irritates, inflames, and becomes so exceedingly painful that the patient demands the removal of the dressings altogether. The great advantages obtained from the length of

the splint being preserved can be appreciated when the lac is applied; the counter-extension is directed exactly as the extension, in the most favourable line,—the axis of the thigh bone; because, as before noticed, its inclination is slightly inwards; from this direction then it follows that not a particle of force is misdirected or lost. Again, with regard to the holes for the reception of the ends of the counter-extending belt, I have mentioned they should be two inches and a half apart, or, more correctly, close to the edges of the splint; this favours the proper axis of traction, and takes the pressure in some degree from the trunk before and behind. From preserving the full length of the splint greater advantages still flow. In fractures of the thigh bone, approximating the hip-joint, the upper and lower fragments cannot be pressed upon and forced out by the perineal belt, because its action is directed upwards; this occurrence may take place if the splint be short, and applied as is usually represented in books; but if adjusted as originally intended by Liston, and according to the directions I have given, no such untoward result can follow. Besides, the pressure of the perineal bandage occasions no uneasiness when directed upward; while on the contrary, if strained outwards across the groin to reach the splint, undue pressure is made on the tender integuments, veins, and numerous lymphatics of this region, and, above all, against the sharp edge of the abductor muscles. The foregoing objections fully apply to Boyer's splint; the pressure of the counter-extending belt cannot be borne, and it must displace the fragments if the fracture be situated high up. After the requisite extension has been secured, the next step is to turn a roller round the limb and splint, commencing at the ankle and continuing it to about the centre of the thigh: during this proceeding it is necessary that the limb be fairly supported, and not permitted to gravitate backwards. A few turns of a wide bandage are likewise made to encircle the trunk and upper part of the splint, and pinned to the counter-extending belt before and behind it. It only remains now to pass the screw through the socket, and attach to it the transverse piece of wood in the manner already described, and the apparatus is perfected, so as altogether to preclude the possibility of inversion or eversion of the foot and lower fragment. It will be observed, by a reference to the plate, that the splint is raised at its lower end from the mattress, by the depth of the transverse piece of wood, and a thin pad fills the intervening space. By this arrangement the foot is somewhat elevated beyond the rest of the limb, and the returning circulation favoured.

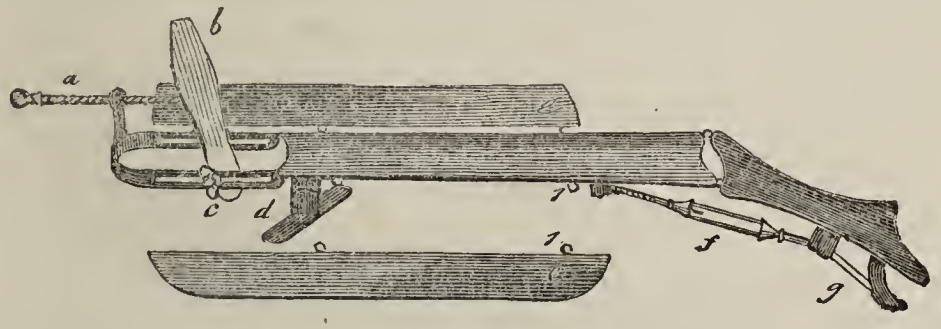
Frequently, when a patient is under treatment for fracture of the thigh by the ordinary method with the long splint, he will complain of pressure at the heel, owing to the limb resting for a length of time on its posterior surface; this unpleasant contingency is entirely obviated by the simple employment of the screw as applied by me; for by a few turns of it any required elevation may be attained, and another annoyance is likewise removed by the transverse handle bearing off the weight of the clothes from the foot. Lastly, from the treatment by continued extension, as I advocate its application, I have never seen troublesome abrasions, relaxation, or weakness of the ligaments of the knee or ankle-joint to result.—*Dublin Quarterly Journal of Med. Science, Feb.* 1853, *p.* 39.

45.—ON A SPLINT FOR FRACTURES OF THE LOWER EXTREMITIES.

By Dr. N. Highmore, Sherborne.

[Like many other practitioners, Dr. Highmore has sometimes met with compound fractures of the leg almost impossible to reduce satisfactorily, and has seen the most violent constitutional excitement ensue in attempting to produce such a result. A new splint which he has had made for such cases as these would seem to possess the following advantages.]

The limb can be placed either in the bent or straight position. Powerful extension can be kept up by means of a screw from the centre of the bottom of the foot, and in a line with the tibia, whilst the ankle and the knee-joints can be kept in any desired state of flexion or extension. A wound can be dressed on either side, or at the top, as often as may be required, without at all disturbing the limb, the bandages and splint remaining firm, and all lateral movement prevented. This is effected by having two sides to let up and down as required, the hinges being so made by hook and eye that either can be taken off and put on again whilst the limb is completely bandaged, or one side only may be applied so as to admit of poulticing on the other.



a, Extension-screw from the centre of the foot. *b*, Foot-board. *c*, Screw to regulate flexion or extension of ankle-joint. *d*, Support of the splint at the bottom, with rule, joint, and pin to fix it. *e*, The moveable side-pieces. *f*, Screw to regulate flexion or extension of knee-joint. *g*, Support of the splint at the upper end. The use of this is to compensate for the difference in length of the thigh-piece and the thigh of a man, which prevents it (in Liston's splint) from resting on the bed without producing undue pressure on the integuments of the thigh. *i*, Hook and eye to fix on the side pieces.

This splint can be seen and procured of Mr. Matthews, surgical instrument maker to King's College Hospital, Portugal-street, Lincoln's Inn.

I subjoin the following case:—

C. P.——, of sober and temperate habits, aged 58 years, fell under a cart which he was driving on the night of the 12th of March, 1851, and the wheel passed over his right leg, producing a fracture of the tibia and fibula. The fracture of the tibia was obliquely transverse, just below the middle of the bone, with great deformity, from the sharp anterior portion of the lower end projecting upwards under the skin, and there was a wound on the inner side of the leg about the size of a fourpenny piece communicating with the fracture, but not corresponding with the deformity, and no bone protruded through it.

The limb was immediately placed on Liston's splint, and extension made to bring the fractured ends of the bones into apposition, and restore the straight line of the skin. This, however, it was found, could not be accomplished with all the force that it was considered justifiable to use; the sharp edge of the lower portion of the tibia *sticking up* under the skin, and resisting all our attempts to reduce it. It was, however, approximated as nearly as possible, and the wound being covered with lint, saturated with blood, it was left at rest.

During the following week two other ineffectual attempts were made to reduce the bone. Suppuration had now commenced in the wound; great constitutional disturbance was set up; the whole leg became inflamed; and it being evident that the end of the bone would ulcerate through the skin, I made an opening from the wound at the side entirely across the tibia, which immediately relieved the tension, and I applied a linseed-meal poultice over the whole.

On the 29th I extracted a piece of bone from the wound, rather larger than the finger-nail, and on the 10th April another piece, both being evidently splinters broken off at the time of the fracture. Suppuration was then going on extensively, with fever, diarrhœa, and great prostration of strength, and there appeared every probability that the man would sink unless amputation was performed, and this he had from the first declared he would never submit to.

Finding, then, that the only chance of saving him was to apply a splint that would fully admit of dressing the wound, whilst lateral support could be given on the sound side, steady extension kept up, and the lower extremity of the tibia at the same time kept down in its place by a fixed flexion of the ankle-joint, and never having seen any apparatus that would effect all these objects, I went to a smith here, who made the splint, now figured, under my direction, and which has answered its purpose so fully that I do not hesitate to recommend it to the profession. It was applied on the 14th of April; steady extension was kept up by the screw at the bottom; the wound was regularly dressed by removing one side-peice, without in the least disturbing the other or unbandaging the limb. The patient began at once to mend; four pieces of loosened bone were removed, and he recovered with a very fair and useful limb. The splint was discontinued on the 23rd of June, when a starched bandage was applied, and the man allowed to get up.—*Lancet, Feb.* 19, 1853, *p.* 173.

46.—ON FRACTURES OF THE THIGH.

By James Terry Hester, Esq., Oxford.

[When the body is elevated or depressed, as in a sitting or lying down posture, the relative position of the thigh to the trunk is altered. Hence, in treating fractured thigh, the patient should be placed in such a bed that this change of relation may be avoided. Mr. Hester has contrived such a desideratum, resembling in its appearance an easy reclining chair, but with a slide upon that part on which the thigh is placed, so as to lengthen or shorten it at will of the attendant, thereby

allowing various motions of the body to take place without disarranging the broken ends of the bone. Mr. Hester says:]

There is one fracture, namely, of the neck of the thigh, to which my bed is, I think, more than to any other, applicable. And here, I protest most strongly against making up one's mind to consider any given case as necessarily incurable, for, with all the rules which have been laid down, no one can say with absolute certainty whether the fracture is within or without the capsule, nor do I think that the impossibility of union, when it is intra-capsular, is by any means established. I do not consider that the means hitherto adopted have afforded a good chance of union, since nothing short of absolute quiet for a great length of time will be sufficient, and if there be a supply of blood adequate to nourish the head of the bone and the detached portion of the neck, I cannot see by what law we are justified in saying that union may not take place. If, on the other hand, the slightest motion be allowed, it cannot be looked for; nor with the fact which I have pointed out, can any mode of treatment be expected to succeed which does not prevent all motion at the hip-joint. Neither in the side position nor on the back, can we possibly expect that a patient will be content to lie without moving for a period of three months, which is the shortest time I should consider safe. In my bed he may sit up or lie down without danger; indeed, when treated on it, the tediousness of a long confinement to bed is quite got rid of, so constantly may he change from the sitting to the recumbent position. If the bone be kept in exact apposition, I cannot see why the periosteum surrounding the neck may not unite, (nor does it follow that in all cases it must be entirely torn asunder,) and so the head of the bone again derive nourishment from the vessels of the shaft.

I have had two cases in which I have thus treated patients with fracture of the neck of the thigh, under the most unfavourable circumstances, and in which most satisfactory results ensued.

Mr. W. Hemmins, a coachman, was brought home from Woodstock, (where the accident happened,) a distance of eight miles. As there was much swelling, and my patient was a very lusty man, no very satisfactory examination could be made, but the case did not admit of doubt. There was shortening and eversion of the limb, and two surgeons, in whose opinion I placed great confidence, agreed with me as to the nature of the accident. The patient was placed on one of my beds, with the thigh at an angle of about 55° with the body, and splints were applied in order to give steadiness to the limb, the foot being fastened to the footboard. Unfortunately, within a few days, he was seized with a severe attack of rheumatic gout, affecting both the knee and ankle, which compelled me to leave off all apparatus, and trust entirely to position. The rheumatic affection continued for a considerable length of time, but at the end of about three months very firm union was found to have taken place, the limb being shortened exactly half an inch. I did not allow this patient to be raised fully to the sitting position for a considerable time, as I was obliged to leave off all means of fixing the pelvis, and I find that unless that be done, there is a strong disposition to slip forwards when the thigh is brought nearly to a level.—*Trans. Prov. Med. and Surg. Association, p.* 166.

47.—DIVISION OF THE TENDO ACHILLIS IN CERTAIN CASES OF FRACTURE OF THE LEG.

Cases under the care of B. B. Cooper, Esq. and A. Shaw, Esq.

[From the perfect ease and safety with which tenotomy has been employed, its use is likely to be considerably extended. Of this, the following case (occurring in a poor woman much addicted to the use of stimulants) is a satisfactory illustration. The case was one of fracture of both bones of the leg, with much bruising of the parts.]

She was put to bed, and, the reduction having been accomplished, the limb was carefully supported by sand-bags. A condition of extreme spasmodic action of the muscles of the calf, however, came on, and the extremities of the bones were constantly suffering displacement by the jumpings of the limb. Great pain was occasioned by these actions, and considerable swelling resulted. After the limb had been repeatedly readjusted, and various expedients resorted to without success, and as there appeared reason to apprehend that the woman's irritable constitution would suffer if this severe local irritation were allowed longer to exist, Mr. Birkett, who, in Mr. Cooper's absence, had taken charge of the case, determined to try the effect of dividing the tendo Achillis. The success which resulted from this operation was most complete; no difficulty whatever was found in keeping the fractured portions in apposition afterwards. The leg was returned to the sand-bags for a few days, being placed so as to relax the gastrocnemius, and allow of the perfect approximation of the ends of the divided tendon. The incision united by the first intention; the leg, after a few days, was placed in splints, and its progress was in every way satisfactory. It should be mentioned, that, in consideration of the patient's previous habits, an allowance of spirit was made her throughout.

There is at present a nearly similar case in the Middlesex Hospital, under the care of Mr. Shaw, which we are the more desirous to mention, as we believe that to Mr. Shaw belongs the credit of having been the first English surgeon who adopted the practice. The patient, an old man, met with a severe compound and comminuted fracture of the right leg six weeks ago. The wound was large, and the bone protruded considerably. Repeated attempts at keeping the fractured portions in apposition failed from the undue spasmodic contractions of the gastrocnemius muscle, which, as soon as they were placed in apposition, at once jerked them apart again. Mr. Shaw divided the tendon by a subcutaneous section, after which reduction was accomplished and maintained without difficulty. The man has since suffered much constitutional irritation from the effects of the fracture, around which severe inflammation took place; it is, however, now subsiding, and great hopes are entertained of his ultimate recovery with a natural limb.

The practice has, we believe, been repeatedly adopted, both by Mr. Cooper and Mr. Shaw, as well as other hospital surgeons, and usually with complete success. It must be borne in mind by those who adopt it, that it is necessary to avoid all pressure on the heel afterwards, otherwise a troublesome sore may result.—*Med. Times and Gazette, Dec.* 18, 1852, *p.* 620.

48.—CASE OF FRACTURE OF THE THIGH-BONE OCCURRING SPONTANEOUSLY.

By Dr. Barnard Van Owen.

[Before the Royal Medical and Chirurgical Society Dr. Van Owen related the following case, which occurred in his own person.]

On the 25th May, 1852, he went to bed in perfect health, and fell into a sound sleep. At three o'clock in the morning he awoke in the act of turning, with a feeling of violent pain in the thigh, just above the knee. On putting his hand to the part he felt the belly of the vastus muscle in strong contraction. At the same moment a loud snap was heard. The swelling of the muscle immediately subsided, and he could feel the grating of the two ends of the bone. He did not experience much pain, and the part was flabby and swollen. From that time he never felt any severe pain at the part or in the limb. He applied a cold wash to the limb, and the swelling began to subside. It was found on examination that a transverse fracture had taken place, three inches above the knee-joint; the bone was lying in proper position. In other respects the author was and had previously been in excellent health. Before the accident he was in the habit of taking a considerable amount of exercise. He had occasionally suffered from slight neuralgic pains in various parts of the body if the digestive organs were in any way deranged. On the day before the occurrence of the fracture he had felt a slight numbness in the leg and foot, below the knee, which was removed by a brisk walk. The limb was in the first instance placed on a M'Intyre's frame, and the leg was placed in a sling, supported by a cradle. After a few days, as this did not seem to limit the movements of the ends of the bone, a long splint was applied, and the leg was allowed to sling as before. The progress of the cure was regular and rapid, and by the 9th of July the limb was considered sufficiently firm to allow of the splint being removed; and some short splints having been applied, he was allowed to get up, and shortly afterwards went out of town for change of air, and walked about with the aid of crutches, which, on the 10th of August, he changed for two crutch-handled sticks, with which he could walk for an hour without fatigue. On the 30th of September he returned to town and resumed his ordinary pursuits, and has since never felt any inconvenience. The author has been unable to find any record of a case of fracture of one of the larger bones by the action of the muscles alone, without the occurrence of any fall, blow, violent exertion, or other exciting cause. He is but fifty-six years of age; has led a perfectly regular life; is capable of considerable exertion; he is not aware of any hereditary tendency to disease, such as cancer or scrofula; he has never had syphilis, nor has he ever been salivated. This case then, he considers to stand alone, and to be worthy of record.

[In speaking of the swinging apparatus employed in the case, Mr. Fergusson expressed his opinion as to its value in cases of fracture of the femur as well as for fractures of the leg, for which latter it had been commonly employed. He had also a high opinion of its use in disease of the knee-joint. Mr. Luke objected to its employment in fractured

thigh, because the two extremities of bone could not be always kept on the apparatus. Mr. HODGSON remarked upon the comfort and convenience of this form of treatment in another class of fractures, namely those of the patella.]—*Lancet, Dec.* 25, 1853, *p.* 591.

49.—CASES OF EXCISION OF THE KNEE-JOINT.

Under the care of W. FERGUSSON, Esq., F.R.S. (Reported by MR. MACAULAY.)

[For some time past we have detailed cases showing the tendency of the surgeon to save the amputation of limbs in some serious affections of the joints. Although this is a gratifying contrast to the recklessness with which they used to be removed, still the period of cicatrization by the new method is very long—a twelvemonth elapsing before the result is produced. Compared with the slow chronic cases of diseased joints, to be sure, this period cannot be looked upon as a very long time. In the elbow, the ankle, and shoulder, the patient has not suffered dangerously from the early effects of the operation. The same remark, however, can by no means be applied to that of the knee-joint. Mr. Fergusson, has, however, recently excised even the knee-joint; and although the ultimate result cannot, of course, as yet be ascertained, (the case being still under treatment), yet it is satisfactory to find that so far it has proceeded favourably. The patient was a young woman, aged about 20, unmarried, accustomed to kneel a great deal. Some time before admission, a swelling in the knee made its appearance, and on its increasing two issues were made on each side of the joint. Four months after admission, an opening was made into the joint, and half an ounce of serous turbid fluid evacuated. On a further examination under chloroform, extensive disorganization was found to exist, and eleven days after this,)

Chloroform having been administered, Mr. Fergusson made an exploratory puncture into the articulation, by which a considerable quantity of turbid serum was freed. On passing the finger into the joint, the articular surfaces were felt rough, and denuded of their cartilage. Mr. Fergusson now made such incisions as would bring the joint into view, and allow him either to take off the thigh at the lower third, or excise the joint, according to the state in which the parts would be found.

These incisions consisted of two lateral ones carried longitudinally on either side of the joint, and a transverse one, uniting the two lateral cuts, about two inches below the patella. A flap was then raised from the front of the joint in the manner of a lid, the hinge of which was situated about the middle of the lower third of the thigh. The patella was of course attached to this flap, and presented, when the latter was turned up, its posterior or articular surface. The joint exhibited considerable thickening of the synovial membrane, with sero-sanguineous secretion from the ulcerated cartilages. Under these circumstances, Mr. Fergusson resolved to make an attempt at saving the limb, and removing the processes of bone entering into the formation of the joint. The condyles

of the femur and the head of the tibia and fibula were sawn off, the instrument cutting very easily through the soft and adipose cancellous structure; the patella was then easily disconnected from the flap in which it was fixed; the projecting masses of thickened synovial membrane were pared, and a few vessels tied.

The hemorrhage was altogether very inconsiderable. Mr. Fergusson now placed the cut extremities of the femur, tibia, and fibula into apposition; but in doing this, he found that the flap originally made was too long; a portion of it, about one inch and a half in depth, was therefore cut off transversely. The wound was closed with sutures; and large pieces of lint, damp with cold water, secured by a roller, were applied to the joint. The patient was placed in bed, the limb lying on a straight channelled splint with foot-piece, being gently supported by Salter's swing, and so adjusted as to be somewhat raised.

After the operation, Mr. Fergusson said that he had found the joint in as diseased a state as he had anticipated. He had now availed himself of a great improvement in practice, which was founded upon statistical data. The manner in which the joint had been brought into view, would have allowed him to perform amputation, if such an operation had been found necessary. Mr. Fergusson hoped this case would prove successful; and he had some reason for the view he was taking, since three out of seven cases on record had terminated favourably. Mr. Jones, of Jersey, had been fortunate in this operation; but even on general principles, and from what we now knew of excision of joints, the procedure was justifiable. He, (Mr. Fergusson), as the pupils could recollect, had had an unsuccessful case of this kind, (the 'Lancet,' vol. ii., 1850, p. 133); but he thought he had done more for this girl, whose health is still robust, than if he had performed the easier operation—namely, the removal of the limb.

On examining the excised processes of bone, it was found that the articular surfaces of the femur and tibia were bared of cartilage, except in a very small spot, the patella being in the same condition.

Nine o'clock, p.m.: The patient has been kept under the influence of opium, and is not in very great pain. A slight oozing of blood. Pulse 146, soft. The girl has been slightly sick.

Second day.—One p.m. The patient is not in much pain; pulse 176, weak; tongue white and moist; the bandage was cut through, though the wound was not tense, and no blood was found in it.—Ten o'clock p.m.: Pulse 140; respiration easy; the edges of the wound were being covered with lymph. The patient has again been sick; she takes egg and brandy in teaspoonfuls, to allay the gastric irritability. There has been pain and slight starting of the thigh.

Third day.—Pulse 144; breathing easy; has been slightly sick again; no pain in the thigh or knee; more action in the wound. Continue the egg and brandy.

Fourth day.—This morning the girl is more cheerful; pulse 120; she takes some clear soup, which she keeps down. Suppuration has commenced.

Fifth day.—Very comfortable and cheerful; there is not much pain in the knee. She continues the gravy soup and eggs. The dressings and

splints were now changed; the skin which covered the patella (being very thin) has slightly ulcerated; there is a plentiful discharge of pus; the stitches were removed.

Sixth day.—Rather feverish; she does not fancy her food; the bowels have not been opened since the operation. An enema was given, and came away untinged. In the evening an ounce of castor-oil was administered, and an evacuation was obtained an hour afterwards.

After this period, the patient went on improving. On the fifteenth day, Mr. Lawson, the house-surgeon, fitted the limb in a box, and slung the whole as before. The bowels became quite regular; and on the 21st day the ends of the bones were in close apposition, and covered with healthy granulations, the external wounds being rapidly advancing towards cicatrization; pulse 104.—*Lancet, Dec. 4th,* 1852, *p.* 518.

[The following is another case of excision of the knee-joint by Mr. Fergusson. The patient, 28 years old and unmarried, had, eleven years before admission, suffered slightly from that affection of the knee-joint commonly termed "Housemaid's Knee." These attacks gradually became more frequent and severe, so that she remained at one time three months in the London Hospital. A year after this she suffered a still severer attack, which, up to the date of her admission, had gradually become more intense. At this time there was distinct evidence of extensive ulceration of the cartilages of the knee-joint, and the health of the patient had of late been very declining.]

Mr. Fergusson used for several months the means best calculated to give the patient relief; strapping, counter-irritation, rest, tonics, &c., were successively tried, but did not induce any favourable change in the articular malady. No external signs of diseased joint were, however, observable, such as fistulous apertures, &c.; in fact, no abscess had ever opened outwardly, and it was evident, in spite of the continual pain, that the acute stage was quite over. Mr. Fergusson, however, despaired of the cure, and it was clear that many years must elapse before any relief could be obtained. Amputation was therefore proposed to the girl, but she refused; and preferred running the chances of excision of the joint, which chances were made plain to her. Mr. Fergusson told her, in fact, that he could not foresee the results of the operation, and that it might be favourable or the reverse.

On the 2nd of April, 1853, the patient was brought into the operating-theatre, and placed under the influence of chloroform. When the anæsthetic agent had produced its full effect, Mr. Fergusson made a longitudinal incision on each side of the joint, about four inches in length, and nearer to the posterior than the anterior part of the articulation. The extremities of these incisions were about on a level with the condyles of the femur and the articular surfaces of the tibia. From the centre of the internal line of incision the knife was carried across the joint and over the patella, by which cut the letter H was completed. Mr. Fergusson then dissected the two flaps thus prepared, upwards and downwards, the patella adhering to the upper flap, and the joint became thus exposed. The knee was now forcibly flexed, and the adhesions which had already taken place between the articulating surfaces were

heard to give way as the flexion was made. Mr. Fergusson now dissected away the tough fibrinous layers which had been thrown out around the condyles of the femur, divided the lateral and crucial ligaments, and sawed off the lower extremity of the femur just above the condyles. The articular surfaces of the tibia were now likewise cleared, and about an inch of the upper part of the bone removed by the horizontal action of the saw. During these steps of the operation Mr. Fergusson had to take away from the concavity and crevices of the joint a concrete substance looking like wet mortar, which was considered as strumous matter deposited in the articular cavity.

There was very little bleeding, and when the lower extremity of the shaft of the femur was examined, it was found that the periosteum came off very easily. Mr. Fergusson thought it prudent to remove about an inch and a half of the denuded bone. The patella, still attached to the upper flap, being eroded on its articular surface, Mr. Fergusson removed it likewise. The flaps were now brought together, secured by sutures and adhesive plaster, and covered with lint wetted in cold water. A splint with hinged sides had beforehand been prepared, and the limb was carefully placed in it, protected by pads covered with oil silk.—*Lancet, April* 16, 1853, *p.* 368.

50.—CASES OF EXCISION OF THE ELBOW JOINT.

Under the care of W. Fergusson, Esq., F.R.S.

[In the first case, reported by Mr. Hulke, the patient, a sailor, had dislocated his left elbow joint, by a fall from the mast-head. A surgeon told him it was a sprain, and gave him an embrocation. Nine months after he became a patient at St. Bartholomew's, but obtained no relief. He now went to Liverpool, where the joint was most violently treated, and so great was the force employed, that the ulna was broken at the union of the middle with the upper third. One year and seven months after, Mr. Cock divided the triceps, but without benefit. Mr. Wakley, at the Royal Free Hospital, afterwards made incisions at the back of the joint, and divided the flexor tendons. The patient, by this last measure, obtained a little power over flexion.]

On admission into King's College Hospital, under the care of Mrs Fergusson, the state of the arm was noted as follows:—There is flatnes. behind the elbow-joint, across the condyles of the humerus; below this the olecranon is unusually prominent; the ulna and humerus are anchylosed, and the former bone seems to have been luxated backwards. The head of the radius rotates freely, and is farther than natural from the outer condyle.

As the patient was very pressing as to something being done to make him regain a partial use of the joint, Mr. Fergusson consented to the re-section of the articulation, which operation took place, October 9th, 1852.

The patient having been completely narcotized with chloroform, Mr. Fergusson made an incision in the shape of an H at the posterior aspect

of the elbow. The tissues covering the bones were reflected, and the ulnar nerve dissected out, and held aside with a blunt hook. The articular end of the humerus was sawn nearly through, and then divided with the bone-forceps; the upper extremity of the ulna and the head of the radius were removed in the same manner.

The anchylosis was found complete, the ulna and humerus having thoroughly united. The bones were very much enlarged and indurated, and to such a degree that they offered considerable resistance to the saw. A few ligatures were applied, the arm placed in a flexed position, the wound closed with stitches, and covered with water-dressing.

Mr. Fergusson, in offering a few remarks, said that the case presented unusual interest, since the operation had been performed upon a joint already anchylosed. Still the arm was of so little use to the patient, that the latter had been very desirous that some procedure should be adopted to improve the state of the joint. He (Mr. Fergusson) had performed, in this instance, an operation somewhat similar to that adopted by Burton, in the United States of America. The operation consisted in taking off a wedge of bone from the articulation, the thin portion of it lying posteriorly. Burton had done this for the knee-joint. The patient was prepared to lose his arm, but Mr. Fergusson preferred trying the operation which had just been performed; it would very probably give the man a tolerably useful limb. The hardness of the bone, which rendered the sawing somewhat more laborious than usual, was probably owing to the great excitement which the part had been subjected to by the numerous operations which had been performed upon it.

Three days after the operation, the arm was placed in a rectangular splint.

On the fifth day, the pain, which for the first two days had been very severe, considerably abated. There was some numbness of the little finger and the contiguous side of the ring-finger.

The patient progressed extremely well; the wound was almost healed on the thirty-third day; there was then a slight power of flexion of the fore-arm upon the arm; and when the man was discharged, six weeks after admission, the action of the joint was sufficient for most ordinary purposes.—*Lancet, Dec.* 4, 1852, *p.* 520.

[The next case was one of long standing, having existed for at least seven years. It was in a woman aged 44. It had run through the usual course—inflammation, suppuration, destruction of cartilage, &c. Before her admission, however, fresh disease had set up in the joint, and the health became completely broken down. In spite of various remedies, the patient got worse, and it was evidently necessary that some operation should be performed.]

The question here was, should amputation of the arm be performed, or should excision of the joint be had recourse to? I believe it was a case where many surgeons would have performed amputation of the upper arm, because I am aware that it is done in cases even of disease of the elbow-joint in young persons; but here the patient was beyond that age at which it was customary to put this proceeding in force. It is

considered that excisions are not so likely to be attended with success in persons of mature age, and in elderly people, as in those more youthful. However, taking all things into consideration, I thought it better to perform excision of the elbow-joint, and I accordingly did this, May 29th, in the ordinary manner; the ends of the bones were in a much diseased condition. The circumstances were very unfavourable here, and I am aware that remarks were made by some persons at the time, to the effect that the operation of excision was extraordinary treatment. These were not intended for my ears, but nevertheless they did reach them. I do not wonder at remarks of this nature coming from individuals who know little or nothing about excision of joints. Those who are familiar with the nature of these operations, and who in reality understand this branch of surgery, do not indulge in depreciatory observations, or, at all events, if they do, they keep them to themselves.

Well, time has proved the correctness of the decision come to in reference to this case; for, although the convalescence was tedious, and great care was required in dressing the wound, the patient progressed most favourably, and we had an opportunity the other day of seeing how well the case has turned out, and what good position the arm is in. The parts were kept, after the operation, in such a position that, should anchylosis occur, there would be a right angle at the elbow. It was not thought likely that a good false joint could be formed here at the patient's advanced age, and therefore there was not any motion allowed; nevertheless, there is now a false joint, and she has now a tolerable use of her fore-arm and hand. Altogether the case may be looked upon as creditable to surgery, and as a good illustration of that which is so aptly termed Conservative Surgery.

The next case is also one of diseased elbow-joint. The name of the patient is Anne Gough, a woman aged 30, who was admitted about a fortnight since into the Victoria Ward. She had been suffering from a disease of the right-elbow joint for two years, which had been treated by various methods, but benefit had not accrued. When she was admitted, the appearance of the joint was just such as is observed in cases where there is very serious disease, although there was not any sinus or fistula. It might have appeared to those who saw it, that there was not so much disease here as in the other case, where there were several sinuses; but I felt certain that the morbid condition was very great. I therefore excised the ends of the bones on November 27th, and here (showing the excised parts) you see them. You can hardly recognise the ends of the radius or ulna, and the lower extremity of the humerus is in a very diseased state. This patient has been doing very well indeed, and, as she is so much younger than the other, I shall by and by permit some gradual motion, in order that a false joint may be formed.

The next and last case in which the operation of excision of the elbow-joint has been performed is one of so interesting a character that I must detail it at somewhat greater length to you. The principal features of the case are detailed in the books as follow:—

"George Gaskin, aged 34, a sailor, was admitted into the Albert Ward at the end of September, with a distorted condition of the left elbow. It appears that while at sea, on the coast of South America,

some seven years back, he fell from the rigging of his vessel, and injured his elbow. According to his own account, it was at that time dislocated. Unfortunately for him, there was not any surgeon on board of his ship, and it was not until after some days that he had any professional advice. He then saw a surgeon, who told him he had merely sprained his arm, and that an embrocation would put it all right.

"After his return to England he went first to St. Bartholomew's Hospital, where attempts were made to put the joint into a more useful position, but they were not attended with any success. The forearm was now nearly on a line with the upper arm, and of course it was very inconvenient to him. He now consulted a quack surgeon in the north of England, who tried by various manipulations to remedy the distorted state of the limb by using powerful flexion, and he succeeded in altering its position; but with this state of things the patient became dissatisfied, and allowed the limb to be violently extended. By these means combined, a certain amount of improvement was brought about. Some time after this he again submitted himself to some more severe manipulations, which ended in producing a fracture of one of the bones of the forearm.

"Sometime afterwards he applied to a surgeon in his native county, who tried hard for a long time to alter the position of the limb, but he did not effect any melioration. The patient subsequently again came to London, and placed himself under the care of one of the surgeons at Guy's Hospital. This gentleman made an attempt to get the arm out of its extended position by cutting across the triceps, and afterwards placing the limb in a certain position, but no good was done by this measure.

"The man then left this institution and entered the Royal Free Hospital, where various incisions were made about the joint, and the flexor tendons were divided. However, the arm remained in the same position. He was afterwards admitted into King's College Hospital.

"The forearm was nearly in a line with the upper arm, and the elbow-joint presented the appearance as though some of the bones had been knocked out of place. The olecranon process was very prominent, and the ulna and humerus were perfectly anchylosed, but the radius was movable on the humerus; there also appeared to be great thickening of the bones. The limb was totally useless to the man from the unfortunate position in which it was retained, and he was willing to undergo any mode of treatment which would promise to bring it into better adaptation for use. Mr. Fergusson, therefore, determined to excise the joint, and afterwards to place the forearm at right angles with the arm, and keep it in that position. Accordingly, on October 9, the patient was placed under the influence of chloroform, and the ordinary incisions in excising the elbow-joint were made, and the ends of the bones were cut out. There was great difficulty in the operation in consequence of the enormous thickening of the extremities of the bones. The arm was placed in a flexed position."

Now, you saw that this man's arm was in such a position before the operation that it could not be of any use to him whatever; and there was, moreover, extensive exudation of new bone, the result of injury or disease. The joint had been cut into by other surgeons, incisions had

been made, and tendons had been divided without any definite object, or without doing any good, and, indeed, it could not be expected that these measures would do any good. When he appeared here it struck me, that if I were to excise the extremities of the bones, it might have the effect of permitting us to place the limb in a position in which it might be of some use to him. Well, after I had done the operation, I took care to order, that in a short time a little motion might be encouraged in order to bring about a false articulation, and you now see the result. The arm is in capital position, the wounds have healed up, and there is a limited motion in the joint. He certainly does not move the joint so freely as I could have wished, because there is a deal of thickening about it, but you saw how enormously the ends of the bones were enlarged when I took them away, and this may possibly account for there being less motion than we usually see in instances of false joint after resection here.

I have not heretofore had an opportunity of doing an operation of this nature with the same purpose in view before, and, in this instance, I was led to adopt this mode of proceeding from what I saw some few months ago whilst I was in Edinburgh. There was a case of anchylosed elbow-joint in the Royal Infirmary there, under the care of my friend Dr. Richard Mackenzie, and it was proposed, in that case, to extirpate the joint. In the course of a week or two afterwards I found that Dr. Mackenzie had performed this operation with the very best results; and I believe that there are many cases in which a similar mode of treatment might be adopted with equal advantage. I must, however, state to you, that in America operations of this nature have been performed, for Dr. Barton, of Philadelphia, has in more than one instance cut through bones near joints which have been anchylosed in a bad position; and, in one instance, that of a sailor, where anchylosis of the hip had taken place, and had rendered the limb useless, the femur was cut through with a favourable result.—*Med. Times and Gazette, Jan.* 15, 1853, *p.* 53.

51.—ON THE DIFFERENT FORMS OF INFLAMMATION IN JOINTS.

By Dr. F. Führer.

In every form of inflammation occurring in a joint, it is found that all the structures appertaining thereto are more or less affected. It follows, therefore, that we must determine in every case the peculiar character of the inflammation, and ascertain by the symptoms the order in which the different structures become involved. For example, that inflammation which commences in the capsule of the joint, accompanied by exudation from the synovial membrane, throughout of destructive character, is different from that which begins in the bones, filling the spongy texture with exudation, breaking through the cartilages, and then exciting acute inflammation and disorganisation of the serous cavity. If we take the three structures of joints which most readily offer themselves to notice, namely, the synovial membrane, the cartila-

ginous covering, and the articular extremity of the bones, we find the basis for an anatomical classification of the different forms of inflammation. As primary affections of the capsule and articular cartilages may be enumerated: traumatic inflammation; rheumatic, gouty, and fungous inflammation; acute empyema. As affections originating in the bones: arthritic and tuberculous inflammation. In the acute form of rheumatic inflammation there is rapid formation of pus, plastic exudation upon a red and injected synovial membrane, softening of the capsule, with rupture, and infiltration of pus among the muscles under the fasciæ. In the chronic form the important character consists in its being connected with necrosis of the bones. Fistulous communications opening externally exist. When the joint is opened there is found a discoloured greyish, or bloody pus, the inner surface of the capsule being of blackish-green hue, and covered with exudation. The ligaments are destroyed, and the bones are discoloured, eroded, and often broken. There is pulpy thickening of the fibrous capsule, and infiltration of the neighbouring parts. The periosteum is thickened, and more firmly adherent than natural. In spite of the disorganisation, the articular cartilages often adhere with great firmness to the surface of the bones. *Arthritic inflammation* is characterised by exudation into the spongy substance of the bones, loosening of their texture, and mollities. In the second stage there are infiltration of fat and abnormal ossifications. In the third stage there are atrophy and alteration in the form of the bones. In the acute form the spongy substance is swollen. and full of blood; the medullary cavity is filled with a jelly-like exudation; the walls of the bone are thinned, so as to be readily cut with a knife. The cartilage is thinned and easily peeled off; the synovial membrane is white, shining, and thickened, and seems as if the secreting property were lost; the cavity of the joint is filled with a thin brownish-red ichorous fluid, which not uncommonly flows externally through fistulous passages. The chronic form, *arthritis chronica sicca,* is much more common. There is loosening of the tissues at the extremity of the bones, infiltration of the spongy substance with an oily fluid, and subsequently a deposition of yellow fat; the cartilage is occasionally hypertrophied; in other cases it becomes thinner and sieve-like; the bones may be completely denuded, except when a false membrane remedies the deficiency; there is no effusion into the cavity of the joint; pendulous masses of fat project from the serous membrane; depositions of bone are found in the neighbouring structures, tendons, ligaments, &c.; the periosteum takes on similar action, which leads to the development of osteophytes. The peculiar substances called corpuscula mobilia are formed from fibrous thickening of the synovial membrane, ossification, and subsequent separation from fracture or division of the pedicle. *Malum coxæ senile* is a stage of the preceding disease. There is erosion of the articular cavity, the bones are denuded of cartilage, and the surface often of ivory hardness; the synovial membrane is dry, so that in forcible flexion there is sometimes a crackling sound. The head of the femur may become so small, and the acetabulum so shallow, that subluxation may ensue; corpuscula mobilia are found in the joint, and the tendency to ossification extends to the surrounding muscles.

In *gouty inflammation* there is most probably an acute and chronic

form; the usual gouty depositions of earthy matter are observed, but the tissues do not seem to undergo the same amount of disorganization as in the preceding.

Fungous inflammation occurs chiefly in the knee, the hand, and the foot, and pursues a chronic, painless course. The synovial membrane and the articular cartilage are thickly studded with greyish red soft granulations, which make their way externally, and lead to the formation of fistulous passages. The surrounding structures are infiltrated. The granulations form, in cases of recovery, a false membrane, which covers the ends of the bones as cartilage.

In *tuberculous inflammation*, the cartilage adheres a long time, but is thinned and perforated, and the perforations lead through fistulous passages into abscesses of the bone. Pus makes its way into the joint, which then loses its cartilage.

Acute empyema of a joint occurs in puerperal diseases, in the desquamation period of scarlet fever, after typhus.—*Virchow's Archiv. für pathologische Anatomie und Physiologie, Fünfter Bandes Erstes Heft.* —*Med. Times and Gazette, Jan.* 15, 1853, *p.* 66.

ORGANS OF CIRCULATION.

52.—ON THE TREATMENT OF ANEURISM.

From a Review of the Surgical Works of Professors Miller and Fergusson, in the 'British and Foreign Medico-Chirurgical Review,' for January 1853. By R. C. Williams, Esq.

[From so important an authority in surgery as Professor Fergusson, the following remarks upon the treatment of aneurism by compression, will be no doubt read with great interest. He says:]

"So far as our comparatively limited experience in the method by pressure, as followed by the Dublin surgeons, will enable us to form an estimate of its value, it seems in many respects, if not in all, preferable to that by deligation of the main artery; and there seems these great advantages in it, that if it does not act satisfactorily, the Hunterian operation may still be resorted to with as much probability of success as ever, while by its application none of those formidable dangers are incurred which are the well-known consequences of the application of the ligature. The difficulties and immediate dangers of a cutting operation are avoided. It may seem strange to make use of such language in the present day, as applicable to ligature of the superficial femoral artery—for that, I assume, to be the vessel meant by the unfortunately vague term of 'femoral;' nevertheless, when it is known that great difficulties have been experienced in such a proceeding, even by hospital surgeons and teachers of surgery, and that the accompanying great vein has been wounded by different operators, the facts cannot be overlooked. Mr. Syme states in the 'Edinburgh Monthly Journal of Medical Science,' for November, 1851, that he has tied the superficial femoral artery

twenty times without a fatal issue, and with perfect success, and both he and his patients may be congratulated on such satisfactory results; but the tables above referred to show no such average success: and when it is borne in mind that the attempt to cure by pressure does not preclude the resource of the ligature, it seems to me that, with the ample evidence before us of the great success which has attended the modern practice by this means, the surgeon should undoubtedly give it a trial ere he resorts to the knife. Unquestionably the evil result of the Hunterian operation, in regard to ligature of the superficial femoral artery, has in many instances resulted from the defective or injurious style of operation, but the same may be said of certain examples where pressure has failed. Granting both of these statements to be correct, it cannot be overlooked that ligature of the superficial femoral artery, done to the perfection of human skill, has nevertheless been followed by the worst possible results. I have seen Mr. Syme perform the operation repeatedly with admirable skill and precision in all points, and the results have been all that could be desired; but I have seen many others, and among them I may name the late Mr. Liston, perform the same operation with an equal amount of tact and judgment, yet the results have been very different. With pressure, surgery has still further resources, but with the ligature the fate of the case is, for a time, placed almost, if not quite, beyond human power; and doubtless the surgeons of Dublin who have resorted to this practice (many of whom stand among the highest of those who have graced the annals of the profession) have duly considered all these points.

For either the popliteal or femoral aneurism the pressure may be made on the common femoral artery, or on the superficial. Sometimes one point may be chosen, sometimes another, and not unfrequently in one case both may be tried alternately.

The principle feature in all the instruments which have been used for such practice is, that, while effectual pressure may be kept up on the main artery, the collateral branches throughout the greater part of the limb have free action, and the part below is sufficiently supplied with blood. Instruments similar to those which were used in the last century have been revived, and some modern improvements have also been called into play. I have seen the tourniquet of Signoroni used with admirable effect; and two of the successful cases in the tables given by Dr. Bellingham were treated under my observation by my friend and former pupil, Mr. Robert Storks, with this instrument alone. But it is difficult to keep the pad steady on one point, and an instrument which fairly encircles the limb, without, however, compressing all the surface, is to be preferred. . . . . An ingenious addition to the common screw force has been applied here by means of bands of caoutchouc, whereby a certain resiliency is acquired, which, while it keeps up effectual pressure, may possibly obviate injurious effects from the screw. . . . . Whatever instrument is used, it is of importance to bear in mind that the absolute stoppage of the circulation is not essential, as it has been proved by experience that a diminished force of circulation is sufficient to effect the desired end. If, however, it is found that pressure strong enough to arrest the flow of blood in the main vessel can be applied, then doubtless the favourable effects may be expected more speedily."

Mr. Miller's observations on the same subject well deserve to be quoted along with those of Mr. Fergusson, and, like them, supply an excellent example of sound and candid surgical reasoning.

"*The Popliteal* is probably the most common of all external aneurisms; and, hitherto, the Hunterian application of ligature to the superficial femoral has been the only approved mode of treatment. Latterly, however, as elsewhere explained, the application of pressure, instead of the ligature, has been employed. And experience is, almost daily, giving direct and undoubted testimony to the efficacy of the practice. There are some patients, doubtless, who may prove intolerant of pressure; and there may be others who prefer the apparent certainty of the knife and ligature to the apparent uncertainty and delay of the compressor. But the greater number of cases are assuredly capable of cure by pressure properly applied; without risk, with but little pain or inconvenience, and without any wearisome amount of privation or confinement. The skin, which is to bear the pressure of the instrument, is protected by a layer of thick soap-plaster; and that, again, may be covered by leather. More than one compressor is used; or, at least, pressure is made at different parts, at different times; so that the burden of it may not all be thrown on one point, but, by being subdivided, may be rendered more tolerable. Using several instruments, along the course of the vessel in the thigh—they may be slackened and tightened alternately; or the same instrument may be shifted in its site, with a like effect. It is never to be forgotten, that all severity of pressure is unnecessary; and that it is not essential to arrest the arterial flow at the compressed point. And it is also important to remember, that should this mode of treatment fail, it by no means interferes with the subsequent performance of the ordinary operation; but, on the contrary, the constitutional treatment suitable for pressure renders the success of subsequent deligation all the more probable. Those surgeons who obstinately adhere to the old operation may adduce, as their apology, a series of successful cases so treated. But this is very plainly a contracted view of the subject; and as well might such practitioners prefer successful amputation of the hand to amputation of a finger, for a simple affection of the latter only. A surgeon of the olden time, who had succeeded in curing several successive cases of popliteal aneurism by amputation of the thigh, might very naturally entertain a distrust and dislike of the proposal to treat the same disease by ligature of the femoral; but the naturalness of such an aversion to the minor and modern practice, would not render it one whit the more reasonable or praiseworthy. And an impartial observer will not consider any one justified, in subjecting his patient to serious risk of life, by hemorrhage, suppuration, and gangrene, while he has it in his power to effect a cure by a minor means, comparatively devoid of risk, and the failure of which will not militate against subsequent recourse to the major procedure—if necessary. Why should a mode of treatment, which causes little or no risk, always be passed by; or why should an operation always be had recourse to, which may, and not unfrequently does, result in direct loss of life? And the question comes in much force, if it be admitted—and statistics will scarcely warrant even feeble contradiction of this any longer—that

the two methods are at least equally successful for the cure of aneurism.

Recorded facts seem to prove the following conclusions:—1. That in popliteal aneurism, skilful compression of the femoral is capable of curing the disease, and that with comparative, and almost absolute safety to life and limb; 2. That the time expended in cure is, on an average, not greater than in the treatment by ligature; 3. That failure by compression does not compromise subsequent recourse to deligation; 4. And that, consequently, compression, when skilfully employed, being equally certain, far more safe, and not more tedious than the ligature, should in the great majority of cases be preferred. The only disadvantage of compression is the care and trouble necessary on the part of the attendant, with irksomeness and sometimes suffering on the part of the patient. The obvious and only advantage of deligation, on the other hand, is the facility and dispatch of its execution, with probable exemption from suffering afterwards by the patient, in the successful cases. The formidable disadvantage is, its proved risk to life and limb."—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 78.

53.—CASE OF ANEURISM BY COMPRESSION.

Under the care of Edward Cock, Esq.

[From a very important case of popliteal aneurism treated by compression, the following points would appear to have been established:]

1. That the main trunk supplying an aneurism sac may be steadily compressed for more than three months without the obliteration of the vessel being obtained.

2. That the aperture establishing a communication between the still patent artery and the sac (the latter being partially filled up by fibrinous layers) may, during the same period, remain open, in spite of compression exerted on the arterial trunk and sac.

3. That the current of blood so admitted has sufficient force to make the aneurismal tumour pulsate continuously.

4. That the sac, notwithstanding the impulse communicated to it by the artery, goes on diminishing in size, and becoming harder.

5. That all pain and uneasiness connected with the aneurismal tumour may cease, although the pulsations do continue.

6. That the tendency for a twelvemonth is rather towards the decrease than the increase of the tumour.

7. That great disturbance of the sac and vessel, producing inflammation and congestion, may so change the relation of parts, and so far favour fibrinous deposits and general adhesions, as to require compression on the main trunk but a short time for the complete obliteration of the latter, and the consolidation of the sac.

[In a second case, however, of the same disease, the features offered a striking contrast. The patient was a carpenter, 57 years of age, tall and robust, and had always been of temperate habits. Three months before admission his leg and thigh had pained him for a few days, and a

month afterwards he found a small lump the size of a plum in the popliteal space. During the next two months the tumour had got gradually larger, so as to seriously impede walking.]

On admission, the patient's state was the following:—There is a strongly pulsating tumour, partly in the right popliteal space, and partly lower down towards the gastrocnemius muscle. The swelling begins above, in the popliteal space, opposite to the upper border of the patella, and ends below, on a level with the tubercle of the tibia. The tumour is round, and about the size of a turkey's egg; it pulsates strongly, and presents, on auscultation, a strong bruit. The chest, on careful exploration, does not yield any evidence of thoracic aneurism. The tumour feels yielding and elastic, and the hand placed upon it receives a sensation as if the vessel were dilated more towards the inner than the outer side.

Mr. Cock, after considering all the symptoms of the case, and giving due regard to the constitution, health, temper, &c., of the patient, resolved to give compression a fair trial, and used a clamp lately modified by Mr. Bigg, to which the latter has given the name of "Bigg's Aneurismal Compressor." The instrument may be described as follows:—

A semicircle of steel, with anterior and posterior moveable arms, the anterior containing the screw and pad to rest on the artery, the posterior holding the hinged cushion or splint, on which the limb is placed. When the instrument is applied, the pad is screwed down so as to *gently* compress the artery. The centre screw is then turned to direct the pad inwards, and fix the artery between it and the bone. The lower screw placed beneath the cushion raises the outer edge of the splint, and prevents the instrument moving in the slightest degree. The advantage of this instrument seemed to us to consist principally in giving the pad a direction inwards towards the bone, and in completely securing the limb by a good broad splint, which may, by a screw placed beneath it, be brought in closer contact with the thigh.

Mr. Cock expressed himself greatly pleased with the manner in which this clamp acted all through the case.

The compression was begun Nov. 24th, and regularly continued to Dec. the 10th, making just sixteen days. The pulsations ceased five days before the apparatus was completely let off; but it was thought advisable to continue the pressure, so as to ensure the due establishment of the collateral circulation. The tumour was on the day of the patient's discharge (Dec. 22, 1852, thirty-seven days after admission) just half its original bulk, and presenting a great degree of hardness. The pressure was kept up with great regularity and patience during the whole of the above-mentioned period; the weight at the groin being substituted for the clamp when the latter was getting too irksome. The patient slept very little for a whole week, as he was anxious to keep up the pressure in the most exact manner; and he was fully rewarded for his close adherence to Mr. Cock's directions, by the speedy solidification of the sac and obliteration of the artery.

When the apparatus had been completely removed, the leg was tightly and evenly secured by a roller; and when the patient first attempted to walk he felt the leg rather weak, but all pain in the limb had quite dis-

appeared. He finally left the hospital Dec. 22, 1852, with the tumour quite solid, and the complete obliteration of the artery.

This is certainly a most satisfactory result of compression in the treatment of aneurism, and likely to make a lasting impression on all those surgeons who saw the case.

The operations of tying the main artery and compressing it for the cure of aneurism are, in fact, identically the same in principle. Some surgeons, like Mr. Syme, prefer the old method. We must say, however, that the compression as used in Dublin and in London seems equally successful, if not more so. It may be sometimes more tedious, but certainly more safe. In both operations the current of blood into the sac is not prevented entirely. The ligature may stop the current in the main artery, but not in the collateral circulation. Therefore in both cases the blood, in fact, is only *impeded* in the tumour—the previous momentum is checked, and the blood passing thus slowly, lines the part with fibrinous deposits; but if it be suddenly checked in the main artery by a ligature, the sac rapidly becomes solidified by coagulum. Eventually, however, both processes are more or less identical.—*Lancet, Jan.* 8, 1853, *p.* 31.

54.—POPLITEAL ANEURISM CURED BY COMPRESSION OF THE FEMORAL ARTERY AT ITS UPPER THIRD.

By Dr. J. Munro, Coldstream Guards.

[The following case deserves every attention, because a slighter degree of pressure than that ordinarily employed, proved sufficient for its cure. The patient was aged twenty-three, of a delicate and spare habit. The accident appeared to have arisen from an effort in playing at cricket. He was under the impression of having received a sprain. A large tumour occupied the popliteal space, and presented all the symptoms of aneurism.]

After a little preparatory treatment, Mr. Phillips's instrument was applied, at first over the brim of the pelvis. The pressure could be borne only an hour and a half; it caused severe pain and feverishness. Believing that this arose in great measure from nervousness, the author employed manual pressure a little below the origin of the profunda. This was effected by the aid of several intelligent convalescents. The artery was compressed only to such a degree as to allow a feeble pulsation of the sac. For the first three days this plan was followed for eight hours only during the day. The patient did not complain at all. There was no feverishness, nor increased œdema of the leg. The clamp tourniquet was now employed, but was removed each night; finding that it was well borne, it was kept on at night also from the 26th. On the 3rd. of May the sac had become harder and smaller, the articular arteries more developed, and the œdema of the calf less. On the 6th the sac ceased to pulsate, and the tourniquet was removed. From this date the absorption of the contents of the sac went on rapidly, and he began to regain the use of his limb. In a short time the measurement round the

limb diminished from sixteen inches and a quarter to fourteen inches and one-third; the femoral artery was pervious. On the 2nd of July he was dismissed to his duty, which he continued to do well till the beginning of November. Before that time his general health seemed worse. On the 19th of November he was again admitted, and an aneurism of the aorta was found near the cœliac axis. He complained of great pain in the loins and abdomen, coldness and numbness of the legs, faintness and nausea. On the 9th of Dec. he seemed to be fast sinking, and died on the following day.

On post-mortem examination, the heart was found of usual size—somewhat flabby on the right side, but the texture sound; valves healthy; no disease of lining membrane; the aorta sound to the situation of the cœliac axis, between which and the superior mesenteric a rupture of its coats was found, and openings communicating with a large sac, of recent formation and filled with coagula. It had burst in two places, and several pounds of blood were found in the cavity of the abdomen. The aneurismal limb was injected; the femoral and popliteal arteries were of natural size and pervious, until opposite the centre of the popliteal space; femoral vein pervious and healthy; the profunda and its branches enlarged; slight thickening, all that remained of the sac; popliteal artery obliterated down to its division into the tibial arteries; popliteal vein also obliterated; the anterior tibial artery enlarged; the posterior of usual size; the peronæal larger than usual; muscular branches large; the ramus anastomoticus magnus three times its usual size, its branches anastomosing with the inferior articular recurrent tibial, and with each other. Two superior articular and an azygos, given off by a common trunk, just previous to the remains of the sac, anastomosed freely with the recurrent tibial and peronæal.

The recurrent tibial was as large as the radial, and anastomosed freely with the articulars and plexus in the peronæal nerve; a tortuous plexus in the substance of the popliteal and peronæal nerves, united below with a recurrent branch from the anterior and posterior tibial behind the head of the fibula; another branch from the azygos communicated with the recurrent branches behind the head of the fibula.

The communication between the external and internal articular was effected by branches three times their natural size; that between the anastomotica magna and inferior articular, between the recurrent tibial and superior articular, by large branches.

[This case having been read before the Medical and Chirurgical Society of London, Mr. HODGSON said he concurred in the opinion that the treatment of aneurism by compression had not attracted that attention which its importance deserved, and which it had obtained in Ireland. He remarked that:]

In Dr. Munro's case, which he had examined, the aneurism and the artery in the ham were obliterated; but above, where the pressure was applied, the artery was pervious and quite in its healthy condition. It was clear, therefore, from these facts, that the cure was not effected, at least in these instances, by producing adhesion between its sides and obliteration of the artery at the point where the pressure was applied.

By what process, then, did compression cause the cure of the disease as effectually as the ligature of the vessel at a distance from the aneurism? From the recorded cases, especially from that communicated by Dr. Monro, it was evident that moderate, but not "obstructive pressure," was that which was required. How did this act upon the artery? In addition to the three proper coats, which formerly were regarded as constituting an artery, modern histologists have demonstrated another texture, composing the inner portion of the middle or elastic coat, and of course, situated between this elastic and the inner coats. In this texture resides the vital contractility of the vessel. Now, it appears that when an artery is subjected to any irritation, this vital contractility is brought into action. When an artery is torn, or violently stretched and elongated, or exposed to a chemical irritant, it is by the agency of this vital contractility that its calibre is diminished; and in extreme cases this sometimes happens to such an extent that its area even becomes completely closed. Compression is one of the agents by which this power may be brought into action. and he believed that it was in this manner that long-continued moderate pressure produced such a diminution in the volume of the stream passing through the main artery to the disease, if not the entire suppression of the current, as to cause those changes to take place in the aneurismal sac, by which the cure of aneurism is effected, when a ligature is applied at a distance from the tumour. In his opinion, it was very important to keep this principle in view in adopting the means of treatment by compression; because, by a moderate degree of long-continued pressure, we should produce all the good effects required, whilst great pressure would produce great suffering, which could be borne, if at all, with extreme difficulty, and often with most injurious effects upon the parts to which it is applied. Ample experience had now proved that long-continued moderate pressure was all that was required to bring about the cure of the disease, and not such a degree of violent pressure as would mechanically prevent the flow of blood through the vessel. The latter idea had, he believed, caused the failure of this practice in many instances in which it had been employed, whilst in others, by causing sloughing, and inflammation, and obstruction in the great venous trunks, and serious engorgement of the limb, its continuance was from necessity abandoned. Many years ago he had been engaged in some experiments on animals, in which attempts were made to procure the obliteration of arteries by powerful local pressure. In very few instances could this be accomplished; the sufferings which it produced were excessive, and generally it caused inflammation of the veins, and most injurious effects upon the surrounding parts.

[Mr. FERGUSSON thought more depended upon the pressure itself than on the influence of the contractile coat. He said:]

Pressure would obstruct the current of blood about one third, more or less; yet the pulsation would continue; that amount of pressure quieted the circulation, and to this more than to anything else he attributed the cure. In calling to mind some points in Dr. Monro's case, he recollected that the calibre of the artery, from the upper part of the superficial femoral to the popliteal, was fully as great as in health.

This was a fact in favour of the cure being effected by pressure only. Another proof was the circumstance that all the compression necessary was that which would impede, but not completely obstruct, the circulation. The same thing might take place in respect to a ligature, and it was only due to Mr. Wardrop to say that he had been the first to show that it was not necessary to entirely obstruct the circulation through the aneurism, but only to diminish it to such an extent as would give rise to the deposition of fibrine.—*Lancet, Jan.* 29, 1853, *p.* 117.

55.—ON THE OBLITERATION OF VARICOSE VEINS, AND THE SOURCES OF DANGER INVOLVED IN THAT OPERATION.

By Henry Lee, Esq.

[Mr. Lee operates in these cases in the following manner:—He first introduces a needle under the trunk of the vein to be obliterated, and leaves it there for a few days; and, 2dly, at the expiration of that time, when the blood on either side of the needle has become coagulated, he completes the operation by dividing the vein by a subcutaneous incision. Mr. Lee then goes on to explain his reasons for thus dividing his operation into two parts; and then considers the effects produced upon the system by the decomposed contents of a vein being received into the circulation, and which subject he considers is still very obscurely understood.]

When a needle is placed under a vein, and a twisted suture applied around its extremities, the vein is in much the same condition as if a ligature were applied to it; and we may judge of the process that takes place in the human subject by that which happens when a ligature is applied to a vein in an animal. When this is done in a horse, the first effect is the stagnation of the blood on each side of the obstruction. The stagnant blood generally coagulates, if the ligature be allowed to remain, during the first twenty-four hours. We have then the vein compressed at one point, and a clot of blood between the ligature and the next communicating branch on each side. But the coagulum is apt to extend much further upon the distal side than upon the side next the heart, because the vessels which supply the tied vein, not being able to empty themselves, are liable also to become distended with coagulated blood. For this reason, it sometimes happens that a long coagulum is formed in the distal portion of the vein, filling it to distension, while the portion next the heart is perfectly empty and collapsed.

A ligature upon a vein does not divide its internal coat, either in man or animals, as happens when an artery is tied. At most some superficial abrasion is produced of the internal tunic. The coats of a vein are by a ligature drawn into longitudinal folds, and a visible line of indentation is produced. The coagulum of blood formed within the vessel moulds itself completely to the shape of the vessel in which it is contained, and bears the marks of the longitudinal folds of the lining membrane, and of its semilunar valves. This inherent power of the blood accurately to

adapt itself to every inequality, and completely to close the vessel, is a very remarkable quality. It is one of the living processes accomplished by the blood which we can trace, and by which we are prepared to understand, other more subtle operations in the animal economy which are more hidden from our observation.

The first effect of the formation of such a coagulum is to prevent any hemorrhage, in case the vessel should be subsequently divided by ulceration or by other means. It also serves the very important office of preventing any fluids from passing along the canal of the vessel, which might prove prejudicial to the system. But a coagulum of this sort is not to be regarded in its mechanical relations alone. It is not a simple plug of foreign matter; it is still a part of the living being, and capable of undergoing many and most important living changes. Some of these are engendered within the confined blood itself, while others are common to it and the surrounding parts. It has, I am aware, been the custom to consider coagulated blood as no longer a part of the living being. Some physiologists have regarded the coagulation of the blood as the act of death; others have looked upon it as the last act of life. Both these ideas have evidently arisen from the action having constantly been observed out of the body, where undoubtedly the separated portion of blood does die. But when we consider, that the conversion of blood into muscle, in the ordinary process of nutrition, is but a modified act of coagulation, it will readily be admitted that the coagulation of a portion of blood by no means necessarily involves its death. In the experiments which Hunter performed of transplanting one portion of an animal (as a tooth or a testicle, for example) into another living being, he had a much higher object in view than the gratification of his curiosity. Although he doubtless was interested and amused to see the tooth of a man growing from the comb of a cock, yet he saw more than this. He saw in it the great principle, that every part of an organised structure is endowed with its own life, and, although incapable of continued separate and independent existence, he inferred that each separate part might live for a certain time; that, in the case of the tooth, for instance, it would retain its vitality when separated from the rest of the body, until it had formed fresh connexions in its new situation. Now, these principles, (extending as they do to every part of the animal system,) you will at once perceive, are applicable to our present subject. The blood alone forms no exception to the general rule. It may for a time retain its vitality, whether in a solid or a fluid form, when separated from the circulating mass. But as it may live and undergo further changes in harmony with the well-being of the part and of the system, so may it die, or become subject to certain morbid actions, and thus be a source of danger to both. We have here, then, two distinct classes of cases; one, in which the separated blood undergoes changes which issue in the reparation of the injury inflicted upon the vein; the other, in which, from some defect in the system, or from some vice in the composition of the blood, the natural and healthy process of repair is not carried out. It will be my endeavour, if time permit, to trace very briefly both these actions (the healthy and the unhealthy) through some of their more ordinary forms. After a portion of the blood has become separated and coagulated, it ad-

heres to the surfaces with which it happens at the time to be in contact. The adhesion thus formed is at first very slight, but it gradually becomes much firmer. The coagulum itself is sometimes solid throughout; at other times it is less consistent and broken; but it always fills the cylinder of the vein. After a ligature has been applied to the jugular vein of a horse, for the first five days there is no blush upon its lining membrane. No signs of adhesive inflammation,—that is, of lymph secreted from inflamed vessels,—can in any part be observed in the interior of the vein. Up to this period, there is no thickening of the proper coats of the vein, and no agglutination of the contiguous folds of membrane. The situation of the ligature is simply marked by a dense white line. But the cellular structure around is thickened by the deposit of lymph. If two ligatures be applied, and the vein divided between them, the cut edges will recede for about an inch; but the process which goes on in the interior of the vein will not materially vary from that above described. At the expiration of a week, a layer of lymph is effused around the ligature, enfolding it in a kind of sheath. After this, ulceration of the coats of the vein commences, and, if the ligature be allowed to remain, continues till the coats of the vein are completely divided. The ulcerated edges at this time adhere firmly to the surrounding cellular sheath, which is thickened by a deposit of lymph. The calibre of the vein at this time has not undergone any diminution or contraction; so that it may happen, that after a ligature has traversed a vein, and the coagulum which it contained has been dissolved or absorbed, the circulation through it may be completely re-established, the ulcerated sides of the vein being represented by the condensed and thickened cellular sheath.

You will now perceive one object which I had in view in dividing the vein by a subcutaneous incision in the patient who has just left, instead of allowing the needles to ulcerate their way out. By such an operation the vein is allowed at once to retract. A pad being then applied, the surrounding areolar tissue is made to occupy the place of the vein, and, uniting there by adhesive inflammation, it prevents the venous channel from becoming re-established.

During the time that the changes which I have attempted to describe are going on in the coats of the vein, other important actions may be going on in its contents. It is necessary, however, to remark, that these changes occur more readily in smaller than in larger animals, and the time required for the coats of the vein to become ulcerated through, is less in the human subject than in the horse, where we have the best opportunities of observing the different stages of this process.

When the blood has become stagnant in an obstructed vein, if its coagulating power be unimpaired, it will occasionally happen that the whole of the blood will form a solid mass. This will adhere to the sides of the vein, and completely obstruct its canal.

At other times, the outer layer of blood alone will form itself into a kind of membrane, which will adhere and become incorporated with the sides of the vein. It will occasionally happen under these circumstances, that the blood in the centre will remain fluid, or will be very loosely coagulated. The less consistent portions may then be removed, and carried in the course of the circulation, leaving a cylinder of fibrine coating the

vein, through which the circulation of the part may be re-established. Now, all these actions may, and do go on without any signs of inflammation, and without any constitutional disturbance. The changes are produced in the fibrine of the blood, which forms a bond of union between the opposed sides of the vein, and obliterates its canal. This obliteration may be temporary or permanent; but, in either case, the material used is derived from the blood itself, and is not the product of inflammation. Thus the canal of a vein may be obstructed by a coagulum; that coagulum may become partially organised or absorbed, or its constituents may be dissolved and carried in the course of the circulation, without any preternatural excitement in the part, or in the system at large. The whole process is conducted without any sign of inflammation, properly so called, and without any unnatural appearance of vascularity of the lining membrane of the vein.

Provided the blood be in a healthy condition, and unmixed with any morbid secretion, the veins consequently may be cut, bruised, or lacerated without any evil consequences. Healthy reparation is produced first by the temporary obstruction of the veins, and then by the removal of that obstruction in one of the ways above-mentioned.

But it will sometimes happen through some morbid condition of the blood itself, or in consequence of the introduction of some vitiated secretions into it, that an unhealthy action is set up. Any morbid matter generated or introduced into the cavity of a vein, has no means of escaping through its dense parietes, and the inflammation and irritation which may then be set up is as great as any that can be produced in any part of the living body. Let me illustrate this in reference to the case upon which I have just operated. Let us suppose that, instead of a healthy coagulum of blood, the contents of the vein had become mixed with some purulent secretion of the part, or that a portion of the fibrine confined within the vein had undergone some degree of decomposition, the healthy and natural actions of the parts would then immediately be disturbed, the skin would become red, the cellular tissue distended, and the whole track of the vein extremely painful. At the same time there would be great constitutional irritation, the pulse and respiration would become excited, and there would be other symptoms of fever, the character of which would vary according to the local changes which took place in the obstructed vein.

The first question which we naturally ask under such circumstances is, supposing there to be some unnatural fluid in the vein, how is that to be got rid of? If there be an external opening in the vein, it may escape in that way; and this is what happens when a wound made in bleeding opens again, and allows the grumous dark-coloured contents of the vein to escape. But it often happens that morbid matter may be retained in a vein where there is no external opening by which it can escape. It is natural to suppose, that, under such circumstances, it would find its way along the channel of the vein into the general circulation; and this, in reality, occasionally happens, and doubtless affords an explanation of the sudden, severe, and even fatal symptoms which have sometimes followed an apparently trifling operation on a vein. It is for the purpose of avoiding any such accident that I have adopted the plan

of operating which I have described. I have thereby the means of ascertaining, before any opening is made in the vein, whether the blood has its natural power of coagulating, and whether the channel of the vessel is closed. If this be the case, a portion of fibrine may decompose in a vein, or purulent secretions may be introduced into it, and only a local irritation will be produced, unattended with any serious symptoms. But should the canal of the vein not be closed, and these same morbid products find their way through it into the general circulation, the most alarming symptoms will result. Some fifty or sixty years ago, when the operation of tying varicose veins without any previous preparation was in vogue, it occurred to Sir E. Home to have a private patient on whom he performed the operation of tying the saphena vein. Symptoms of typhoid fever set in, and terminated fatally in two or three days. About the same time, two other cases occurred in St. George's Hospital, where, after the operation of tying the saphena vein, similar symptoms manifested themselves, and the patients narrowly escaped with their lives.

Sir B. Brodie, upon whose authority these cases are given, not being satisfied with an operation which was occasionally followed by such consequences, suggested a modification of it. He introduced a very thin knife under the skin, and divided the vein by subcutaneous section. This operation, for a time, appeared to answer; but a case at length happened in which the patient died four days after the operation. After this, so great was the fear of wounding the saphena vein, that no surgeon in London ventured to perform the operation for several years. Indeed, up to the present time, something like a superstitious dread is entertained generally respecting the ligature of veins, without, however, any distinct ideas having been given as to the real source of danger in such cases.

In pursuing some investigations relative to this subject, I was induced to believe that the decomposed and putrid fibrine of the blood was the real cause of the very serious symptoms in these cases; but, being at a loss to know what the effects of putrid fibrine were upon the animal system, and having been able to obtain no information upon this subject from any published work that I was acquainted with, I determined to try what the result of the introduction of such a fluid into the vascular system would be. Accordingly, having obtained the assistance of a veterinary surgeon, and having obtained some fibrine in a very putrid condition, I caused an ounce of the decomposed fluid, mixed with an equal quantity of water, to be injected into the jugular vein of a donkey. The fluid passed without obstruction into the course of the circulation, and in a few moments the animal gave three or four groans expressive of great distress. The vital powers appeared to be suddenly prostrated; the animal lay unable to rise, and soon fell into a state of syncope. This lasted a few minutes. On getting up, the animal reeled and staggered about, but subsequently recovered sufficiently to walk to his stable. Some reaction now commenced; the breathing was disturbed, short, and quick; the pulse, which naturally beats about 36 in the minute, rose to 120. These symptoms continued about an hour and a half. After this, the animal became very restless and uneasy, and evinced internal pain by groaning and looking at his side. The animal died four hours after the operation.

On a *post-mortem* examination, the jugular vein, into which the decomposed fluid had been injected, was found in its natural condition, and partially distended with fluid blood. It was pervious throughout its whole length, and contained no coagula. The lungs were found studded with irregularly-circumscribed soft black patches. When cut into, these discharged a blackish fluid, having the appearance of a mixture of blood and ink, and of a strong putrid smell. The cœcum and colon, and a portion of the small intestines, were deeply congested, and of a dark livid colour.

In this instance, the decomposed fibrine evidently acted as a most virulent poison upon the system. In fact, there are few animal poisons known which would produce such serious effects in the same space of time. But it will be asked, if such serious effects follow the introduction of putrid fibrine into the circulating system, how is it that these results are not oftener manifested, seeing that the blood must constantly be liable to its influence? This must constantly happen in cases of sloughing wounds, and in cases of abscesses in the course of inflamed veins.

In healthy states of the constitution, the system is preserved by a very wonderful provision, and one which could not have been anticipated, I presume, by any process of reasoning. The blood has itself the power of fixing some morbid matters that come in contact with it, and, by entering into a kind of combination with the first particles that present themselves, it effectually seals the vessels against the entrance of any further portions. It is indeed generally conceived, that putrid fluids mixing with the blood prevent its coagulation; and this I believe to be generally true. But the effect of slightly decomposed fibrine upon the blood offers a marked and very peculiar exception to this rule. The blood in the living being is, as I have said, peculiarly liable to the influence of putrid fibrine; and it is in perfect accordance with the usual economy of nature to find the sensibilities of a part actively alive to those influences which are calculated to affect it injuriously. Now, the sensibilities of the blood for its self-preservation will be found, upon examination, to be as evident as those of other parts of the body, and to be called into operation in an especial manner with regard to the action of putrid fibrine.

The following experiments will show how readily the presence of such decomposed fibrine is felt by the living blood, and will also illustrate the means employed for the preservation of the system from its injurious and poisonous influence. Having obtained some fibrine quite firm and free from any colouring matter, I allowed it to decompose till it became fluid. A small quantity of this was mixed with some recently drawn blood, and in less than two minutes the mixture had formed a uniform soft coagulum. This experiment was repeated upon some blood drawn from a healthy horse, with a similar result. Now, these experiments show that the action of putrid fibrine upon the blood is similar to that of pus. If pus be mixed with recently drawn blood, it will have the effect of coagulating it in about two minutes; but if injected into a vein, the coagulation will take place almost immediately. This is known by the thickened and cord-like feeling of the vein, and by the circulation

through it being obstructed. It is evident that the effect of such an action must be to prevent the morbid matter from passing into the circulation. The putrid fibrine or the pus unites with the first portions of blood with which they come in contact. They form with it a coagulum, which adheres to the sides of the vessel in which it is contained, and effectually seals it against the entrance of any further portions of morbid matter. The irritating substance is thus fixed and localised to that portion of the vascular system where it is first formed; and, although it may produce a considerable amount of irritation and suppuration here, yet, if the coagula formed be sufficiently firm, the system will be preserved. A local inflammation alone will be produced, and the poisonous effects of the morbid matter will not be felt by the constitution. A practical illustration is here presented of a principle long and perseveringly advocated by Dr. Wilson, of St. George's Hospital, namely, that the coagulation of the blood out of the body is only a feeble expression of its much more energetic action in the living system. The one act of its changing its form when withdrawn from the body, is the last expression of that wonderful power, by which, while in the body, it is constantly changing its form from the fluid to the solid, and from the solid to the fluid, in the various processes of growth, nutrition, and decay. It was the consideration of this power, as evinced in the preservation of the system from the effects of the circulation of purulent fluids, that led me to adopt the plan of ascertaining that the vein was obstructed before dividing it in the operation for varicose veins. As nature adopted this plan of preventing the absorption of vitiated fluids when formed, it appeared to me, that increased security would be given, if it were ascertained that a firm coagulum obstructed the vein before its coats were injured. This is effected by the simple expedient of keeping the blood at rest for a certain time in a vein; and by the mode now adopted, we have the great advantage of insuring that the coagulum is composed of blood alone, and not blood in combination with pus or other vitiated fluid. This may be a point of considerable importance, for a time comes when portions of the coagulum are dissolved and carried in the course of the circulation. If formed from healthy blood, this process is attended with no constitutional disturbance; but if the coagula have been partly composed of vitiated fluids, a train of symptoms may be induced which exercise most important influences upon the system.

If the quantity of vitiated fluid mixing with the blood be large, or if it be in an advanced stage of decomposition, the coagulum by which it is retained may be very loosely formed. The central portions will then become softened down, more or less deprived of their colouring matter, and converted into a fluid resembling pus. As the process of softening proceeds, the coagulum which first formed becomes gradually of less consistence, and at length the vitiated fluid contained in its centre escapes, and is poured into some of the adjacent veins. It here determines, under ordinary circumstances, one of the three following physical results.

First. The dissolved matter, which has often the appearance of pus, mixing with fresh portions of blood, may determine the formation of fresh coagula. These may retain the vitiated fluid, and, adhering at

intervals to the sides of the vein, they may for a time prevent any of the morbid matter from reaching the general circulation. Within a short period, however, the centres of the newly-formed coagula will become softened and gradually deprived of their colouring matter. The process of softening will proceed from the centre towards the circumference of each portion, until the greater part, or the whole, is converted into a thick fluid, resembling pus. This fluid it is which has been so often mistaken for pus in the veins.

Secondly. The blood that has been infected, instead of coagulating, may separate into its different elements. The fibrine in this case separates from the rest, and, allowing the serum and colouring matter of the blood to pass on, may adhere to any part of the vascular system with which it comes in contact. The vessel in which the adherent fibrine is contained is not completely obstructed, as happens when the blood coagulates in a vein. The difference is this, that in one case the fibrine alone of the blood is detained, and in the other all the parts of the blood are contained in the clot. In the first case, the circulation can be still carried on between the fibrinous deposit and the opposite side of the vein; in the second, the calibre of the vessel is completely obstructed. An instance of this form of contaminated blood presented itself a short time ago in this hospital, in an old man who had a large tumour removed from the back part of the arm. A few days after the operation, he was attacked with erysipelas, which terminated in mortification of the part and death. In that case I had an opportunity of pointing out to those gentlemen who witnessed the post-mortem examination, that the axillary vein and its branches were about half filled with firm portions of decolorised fibrine, which had evidently formed before death, and by the side of which the circulation of the limb had for a time been maintained. In this instance the blood in the immediate neighbourhood of the wound was of a very black colour, and quite fluid.

Another remarkable instance of this form of diseased blood came under my care in the hospital during Mr. Fergusson's absence in Sept. last. A man, aged 37, was admitted, having six months previously fractured his patella; after which, although he was enabled to walk, he always experienced a sense of stiffness in the joint. On September 17th, he was attacked at two o'clock in the morning with a succession of rigors, which continued until the middle of that day. An abscess subsequently formed in the knee-joint, and the cellular tissue between the muscles of the leg and thigh were extensively infiltrated with pus. The shiverings were repeated on several days after his admission into the hospital, and were followed by most profuse and exhausting perspirations. He died on the 16th of October. On a *post-mortem* examination the patella was found to be softened in its interior; one part of its posterior surface was rough and carious, and lying in contact with this exposed surface was a small detached portion of dead bone. The profunda vein was found to be filled with coagula, but the superficial femoral contained only a small quantity of fluid blood. At the junction of the two (and this is the point to which I wish particularly to direct your attention) was a considerable mass of white adherent fibrine. This was easily removed from the lining membrane of the vein, which then presented

its natural polished appearance. No signs of inflammation of the lining membrane could be discovered. The portion of decolorised fibrine to which I have referred was removed from the vein, and when pressed between the fingers a small quantity of white purulent-looking matter escaped from its interior. At the lower part of the right lung were several small oval deposits of white matter, as firm in consistence as ordinary tubercle. In other parts of the same lobe were larger indurated masses, containing in their centres discoloured purulent-looking fluid. The point of the greatest interest in this case is, that, upon a microscopical examination, the appearances of the white fluid from the clot in the vein accurately resembled that from the secondary deposits in the lung. We therefore naturally come to the conclusion, that, in both these situations, the purulent-looking fluid was formed in the same way, and that the same action which produced its development in the fibrine after it had travelled from the seat of injury to the termination of the profunda vein, produced its developments in the lung, at a still greater distance from the original source of mischief.

The third physical change that may take place in contaminated blood is, that it may decompose: instead of coagulating or of separating into its different elements it may become putrid in the vessels of the body. The whole of the constituents of the blood are then involved in the changes which take place. Fortunately, we have few examples of this disease in the London hospitals at present; but during the prevalence of severe epidemics they are not so very uncommon. In the severer forms of puerperal fever especially, the whole mass of the blood appears to be contaminated, and whenever it stagnates. it shows a tendency to decompose. Any organ attacked in this state of the system will pass most rapidly into a state of gangrene. In a single day an organ may become attacked, its structure softened and broken down, and it will then present the characters of a putrid abscess.

Not long ago I had the opportunity of examining a case of a woman who miscarried during the sixth month of her pregnancy. A few days afterwards, she was attacked with intense pain in the abdomen, and, two or three days later, with pain in the calf of the left leg. The pain in the leg was accompanied by swelling, which afterwards extended up the thigh. She died shortly after the attack. Upon examining the body after death, a small putrid abscess occupied the course of one of the branches of the hypogastric vein, at a short distance from the neck of the uterus; the iliac and femoral veins of the same side were filled with blood in every stage of decomposition; the spermatic vein of the same side was stained of a dark purple colour, but its canal was pervious, and contained no coagula.

The remarks which I have now made have reference to contaminated blood generally whenever the morbid matter is derived from purulent secretions or from putrid fibrine. The examples are now rare in which these forms of blood disease present themselves after injury to the superficial veins of the body; but formerly, when bleeding was more practised than it is at present, cases of the kind were not very uncommon. In the operation of obliterating varicose veins, no example of any severe disease has presented itself hitherto in this hospital, but, as fatal cases

do occasionally occur, it is well to take every precaution. In the operation which I have recommended, all the usual sources of danger are, I believe, guarded against. We have the means of ascertaining before the vein itself is injured, that its cavity is obliterated; and we may judge of the firmness of the coagula which it contains. Should the coagulum of blood not form in any case after the introduction of the needles below the vein, in such an instance I certainly should decline to proceed with the operation. I should consider that, from some cause or other, the coagulating power of the blood was deficient, and that there was no security that any morbid matter which might accidentally be formed in the part would not be conveyed along the channel of the vein into the general circulation.

It might at first appear an objection to this mode of operating, that it required a longer time than if the operation could be performed at once; but this is not the case. I have here the notes of a case which I recently treated in this way. A woman was admitted into this hospital on the 29th of September last, with a large cluster of veins on the inner side of the right leg, and one very large vein extending up the inner side of the thigh.

On the 2nd of October, a needle was introduced behind the cluster of veins in the leg, and also behind the enlarged vein in the thigh.

On the 5th, the needles were removed, and the veins divided by subcutaneous incision.

On the 9th, she was enabled to leave her bed; and on the 17th she left the hospital.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 5.

56.—MR. STARTIN'S NEW METHOD OF APPLYING THE LIGATURE IN THE TREATMENT OF NÆVUS.

[The degree of success which has followed the adoption of Mr. Startin's novel and ingenious plan of treating nævus, safely warrants us in regarding it as a valuable addition to the resources of surgery.]

The method alluded to, which has already been described by its author in the pages of this journal, consists in the introduction of a subcutaneous ligature, composed of a single thread, around the base of the nævus, and then attaching its two ends, which are brought out at the same point, to a band of india-rubber, by which elastic traction is kept up until the thread cuts its way out. By this means the whole of the vascular structure is divided, and that by such a slow process that ample time is allowed for the vessels to become plugged up and permanently obliterated. In principle, it will be seen that it is not very dissimilar to an operation sometimes adopted for fistulæ in ano, in which a wire ligature is introduced from above and gradually tightened.

In introducing the ligature, Mr. Startin proceeds in precisely the same way that is usually adopted when subcutaneous strangulation is intended,—every part of the growth must be surrounded, and none of the skin. This done, the ends of the ligature are tied pretty tightly, but not nearly so much so as to produce strangulation, and, a knot

having been made, the threads are attached to the elastic band. The latter is then stretched to a due degree of tension, so as to pull strongly on the ligature, and then securely fixed to some other part of the person by a bandage or long slip of plaster.

The length of time taken by the ligature in cutting its way through, varies of course according to the amount of traction put on it and the size of the nævus: from a week to ten days being the average in Mr. Startin's practice. It always acts as a mild seton, and gives rise to some suppuration in its track.

The most important difference in result, between this and almost all other methods of treating nævi, is, that it *produces no destruction of the part whatever, and consequently leaves no cicatrix.* When the disease is situated on the face, forehead, neck, or scalp, this is an extremely valuable recommendation, and more especially so if it chance to in any way way involve the lower eyelid, for should the contraction of a cicatrix be produced here, a troublesome and very disfiguring ectropium is almost sure to result. With regard to the upper eyelid, which is very frequently the seat of nævus, this fortunately does not hold good; the skin is lax, and very extensible, and eversion of the lid is not produced by any moderate amount of injury. We lately saw a cutaneous nævus, which involved almost all the whole of this lid, in an infant under the care of Mr. Wordsworth, at the Royal Ophthalmic Hospital. By strangulation in the ordinary way, performed at two operations, it was completely got rid of, no eversion followed, and a mere linear cicatrix was all that remained.

It must, however, be confessed that Mr. Startin's plan does not invariably avoid the production of a cicatrix, for in a few cases in which the disorganisation of the skin has been very great, and the whole structures much thickened, although its vascularity is destroyed by the operation, there yet remaining a very visible deformity, the excision of the patch of now condensed cellular structure is necessitated. This may be done, however, without any risk of hemorrhage, and the scar left is very small. In the majority of instances, the patch, although at first much thickened, becomes, by a process of interstitial absorption, restored to an almost natural condition in the course of a few months.

We now come to speak of the kinds of nævus to which this treatment is not applicable. 1. When the disease is seated on parts which, from being pendulous and not firmly fixed, cannot bear the necessary traction, such as the ear, the lips, or the genital organs. 2. When the nævus is purely cutaneous; for if the morbid vascularity be derived from the skin itself, it is obvious that division of the subcutaneous tissues will not cure it. In the large class of cases in which the two forms occur together, there can be little doubt but that the skin is affected secondarily, and derives its supply of diseased vessels from below. We have searched in vain for any recorded anatomical observations which should prove this; but were it not so, no explanation could be afforded of the general success, as regards the skin, of the plan we are considering. There has even occurred more than one example in which a circumscribed port-wine stain of the skin, attended by little or no evidence of subcutaneous disease, has been completely cured by the use of this form of ligature,

making it probable that the disease is rarely confined to the skin. 3. In cases in which there is no reason for wishing to avoid a cicatrix, we can see no advantage likely to accrue from the new method in preference to strangulation by ligature, that would counterbalance the trouble and loss of time consequent on its adoption. The cure is more protracted and less complete.—*Med. Times and Gazette, Dec.* 11, 1852, *p.* 594.

57.—*Tincture of Mastic as a Hæmostatic.*—It is stated in a recent number of *Schmidt's Jahrbucher,* that Dr. Frankl has found the tincture of mastic an excellent hæmostatic. He employs it in epistaxis, and in troublesome bleeding from leech bites. It is applied to the points whence the blood issues, by means of a camel's hair pencil. Terzer, a dentist of Vienna, is also reported to have used it successfully in hemorrhage following the extraction of teeth.—*Association Med. Journ., Jan.* 14, 1853, *p.* 43.

ORGANS OF RESPIRATION.

58.—TRACHEOTOMY, WITH A NEW METHOD OF PERFORMING THE OPERATION.

By Henry Thompson, Esq., M.B., M.R.C.S., Surgeon to the Blenheim Street Dispensary.

[The statement of Dr. Marshall Hall—that the operation of making an artificial opening into some part of the respiratory apparatus will soon be of no unfrequent occurrence—is considered by Mr. Thompson too decided to render it necessary for him to enter into discussion upon it. The object he has in view is to consider the present modes of carrying out the principle practically; and whether any means more advantageous might be found. He says,]

Three principal operations have been adopted for the purpose of opening the great air passage below the rima glottidis. Strangely enough, all these have been comprehended by systematic writers under the single term *bronchotomy*, although it is almost unnecessary to say, that the bronchus is never divided in any one of them. Regarded singly, they are known as *tracheotomy, laryngotomy,* and *larnygo-tracheotomy.* It is needless to describe these in detail.

Tracheotomy consists in laying bare the trachea at some point by dissection through the superjacent structures, and cutting through one or more of its rings, usually from about the third to the sixth. This method has been practised by surgeons from a very early period.

Laryngotomy is an incision into the membrane which intervenes between the thyroid and cricoid cartilages. Desault divided the former also, from below upwards, to a certain extent.

Laryngo-tracheotomy, commencing by an incision in the membranous

space described, divides the cricoid cartilage, and more or less of the trachea below. This was Boyer's method.

These operations have not been employed indifferently. Without quoting at length numerous authorities which have been consulted, it may be stated that it has been in the main a generally-received axiom among all surgeons, that when nothing more is indicated than the admission of air to the passages below the rima glottidis, laryngotomy is sufficient for the purpose, being also a much less difficult and serious proceeding than tracheotomy. But that when the removal of a foreign body is proposed, either tracheotomy, laryngo-tracheotomy, or the laryngotomy of Desault must be resorted to. Further, that when it is intended that a tube should be worn subsequently, for any considerable period of time, tracheotomy is to be employed, the larynx being too sensitive to admit of its long-continued presence. After laryngo-tracheotomy also, the tube has been found to give rise to much irritation.

Let us briefly compare these operations in relation to the difficulties and dangers which are encountered in each.

The trachea above the sternum, by its anterior aspect, has the following structures in contact, or in close proximity with it:—

First, the isthmus of the thyroid body; the size and position of which varies somewhat, while it is also a little larger in the female than in the male. This is most commonly situated opposite to the third and fourth rings, reckoning from the top. On each side it enlarges, forming a lobe, which is closely applied to the side of the tube. A very large arterial supply is afforded to this body by numerous branches of the superior and inferior thyroid arteries, of which the latter are distributed chiefly to its under surface, where a free anastomosis exists between the vessels of either side. Rarely, there exists a third lobe, formed by a small projection of glandular substance from either side of the middle line, generally from the left. Lower down some subcutaneous veins may be found of varying size; frequently a vessel, uniting the two anterior jugulars, crosses the region an inch or so above the sternum. Below the thyroid, the trachea is overlapped by the sterno-thyroid and sterno-hyoid muscles, and in the interval between these by the deep cervical fascia. On separating them, several veins, sometimes of large size, (inferior thyroid,) may be seen crossing the trachea to reach the innominate vein, which usually become more closely aggregated as they approach the sternum; here also are a few tracheal branches from the inferior thyroid artery; and on each side at this part the two carotid arteries are closely applied to it for a greater or less portion of its length, the innominate and left carotid having crossed obliquely in front of it at the episternal notch or thereabouts. An irregular arterial branch of considerable size is occasionally met with here, lying in front of the trachea, and ascending upon it to the thyroid body. This is the "*thyroidea ima*" of Neubauer and Erdmann; other large vessels may be occasionally found in this situation, but such an occurrence is more exceptional than the preceding.

Next, respecting the relation of the trachea to the external surface. Immediately beneath the cricoid cartilage, at its commencement, it is subcutaneous, the distance at which it lies from the surface gradually increasing from this point, until, opposite the top of the sternum, it is

usually found in the adult at a depth of about one inch to an inch and a quarter. This, however, is sometimes increased in fat subjects, although it may be less in those who are emaciated.

In cases of acute inflammation of the larynx and of the neighbouring structures, there is sometimes so much œdema of the external parts that the distance of the trachea from the surface is greatly increased. Mr. Macnamara, of the Meath Hospital, reports a case in which, when operating, he found the trachea at two inches and a half from the surface, in consequence of this condition of the integuments.

Hitherto, most surgeons have fixed upon that part of the trachea which is immediately below the thyroid body as the most eligible spot for making an opening into it. Velpeau advises that the fourth, fifth, and sixth rings should be cut, and if necessary the third and seventh in addition. Some prefer the upper rings, considering that a division of the isthmus of the thyroid is less hazardous than an incision lower down, which incurs the probability of inflicting injury upon more important structures. Thus, Malgaigne, considering that the dangers increase in proportion as the wound approaches the sternum, prefers cutting the upper rings of the trachea and dividing the isthmus of the thyroid body, respecting which he says—"After having divided the isthmus of the thyroid gland, and the venous plexus below it, (if such cannot be pushed aside,) the trachea is exposed. Then the patient should be directed to make deep inspirations in order to lessen the venous hemorrhage; and next, such vessels as continue to bleed should be tied." Mr. Lawrence adopted a similar method of operating in the cases which he reported in a paper read before the Medico-Chirurgical Society. ('Transactions, vol. vi., art. xv.)

In reviewing the opinions which have been recorded by practical surgeons respecting the operation of tracheotomy, an almost unanimous admission that considerable difficulties frequently attend its performance is met with. Sir Charles Bell gives a graphic account of the difficulties which presented in a case in which he attempted to perform it. Having laid bare the trachea, he states that he was unable to make an opening, because, on account of the laborious respirations of the patient, the "variation in depth of the trachea was not less than an inch in inspiration and expiration." He then successfully performed laryngotomy instead; and he afterwards greatly preferred that operation, whenever it could be substituted for the former. M. Roux, in endeavouring to perform tracheotomy at "La Charité," on one occasion was compelled to apply six ligatures in the course of the preliminary incisions, and, after all, abandoned the operation for laryngotomy. On a previous occasion he saved the life of a patient by sucking the blood from the air-passages, by which she had become asphyxiated, and afterwards employing artificial respiration.

Mr. Porter, unquestionably an experienced authority on this subject, although an advocate for the operation of tracheotomy, admits that it is frequently difficult. He adds, that "in children it is particularly so, as the depth of the parts to be cut through is increased by the accumulation of fat, generally met with in patients at this period of life, and besides, previous to the age of thirteen or fourteen years, the trachea is comparatively of a small size."

It is, however, unnecessary to adduce numerous authorities for the purpose of showing that, under the most favourable circumstances, tracheotomy in the adult is an operation not generally easy of performance, and that in the child its difficulties are greatly increased. Here the trachea itself is so small, and the space between the two carotid arteries so limited, that the proceeding is a hazardous one, especially if the patient be unruly. Desault's strong preference for laryngotomy may be traced to the fact that, in the early part of his career, he lost a young patient in an attempt to open the trachea, from the delay occasioned by hemorrhage in the preliminary incisions, during which the patient expired. He also records a case of death in another abortive attempt, from wound of the carotid.

Of laryngotomy little need be said. The interval between the cricoid and thyroid cartilages may be opened with ease by a lancet puncture. It is usual to make first a short longitudinal cut through the skin, and then a single or a crucial one through the membrane. A little artery crosses this space, which is said to be sometimes the source of troublesome hemorrhage in an operation for laryngotomy.

In laryngo-tracheotomy, the isthmus of the thyroid body is cut—a circumstance which does not appear to have interfered with the performance of the operation, or to have been regarded as an objection to it. But incisions which deviate slightly from the middle line are liable to injure one of its lobes, and to cause profuse bleeding.

Of these three operations, tracheotomy is unquestionably the one most frequently resorted to in the present day when an opening below the glottis is required; and for the purpose of removing foreign bodies it affords very probably the best chance of success. It is often employed in cases where asphyxia is imminent—in circumstances where time is of the utmost importance, and the patient's danger is to be estimated by the lapse of minutes. Yet the quarter or even the half of an hour frequently passes before the desired opening can be made. Meantime the sufferer is rapidly losing his powers of life, and succour, when afforded, may have come too late, and that by a few minutes only. The delay is due to bleeding vessels, chiefly veins, which being distended through the medium of pulmonary obstruction, which commonly exists, pour out their contents with great rapidity; and these, it is feared, might be rapidly sucked in with the first powerful inspirations, through the tracheal incisions, and so cause irremediable asphyxia. Cessation of the hemorrhage is therefore patiently awaited. It is, however, to be borne in mind that this delay may not necessarily be the best mode of meeting the difficulty. Such hemorrhage is greatly due to congestion of the venous trunks depending on obstructed respiration. Thus, some advise an opening to be promptly made into the trachea, as the most efficient method of checking it. On such grounds, the trocar has been employed to effect the required opening. It was supposed that the introduction of the tube upon the cutting instrument itself would effectually shut out blood, while it let in air. Experience, however, has not given much countenance to this method. The force required to make an opening sufficiently large by means of the trocar is considerable, calculated often to bring the opposite sides of the trachea into contact, and hence its em-

ployment has generally been considered a somewhat dangerous procedure. It is sufficiently obvious that laryngotomy offers a valuable method of making an opening into the air-passages, as occupying only the minimum amount of time which can be required for the most simple surgical operation. Its efficiency has been well shewn by Mr. Prescott Hewett, in an article upon the subject in the 'London Journal of Medicine,' Feb. 1849. The result of a considerable number of carefully-made observations appeared to be, that in cases of œdema of the glottis, whether by extension of inflammation from surrounding parts, as in pharyngitis, tonsillitis, &c., or the swallowing of boiling water, acids, &c., the œdematous condition never extended below the margins of the true vocal cords. Consequently, laryngotomy is amply sufficient to meet the exigency in these cases. In tracheitis (true croup), and in diseases primarily affecting the larynx itself, it is generally considered necessary to make the opening lower down.

But an opening into the larynx is not compatible, as a rule, with the *habitual* presence of a tube afterwards. An important desideratum therefore exists—viz., an operation which can be *safely, easily,* and *rapidly* performed, capable of affording an adequate supply of air to the lungs when the glottis is closed, and at the same time *applicable to some part of the air-passages which does not resent the continued presence of a tube.*

Dr. Marshall Hall has for some time past entertained the idea that an opening might be made into the trachea by a simple puncture of the tissues, and subsequent enlargement of the aperture by a process of *dilatation,* to an extent sufficient to admit of the insertion of a tube. This latter also he has proposed to make of wire, in such a manner that by pressure its diameter may be considerably diminished, so as to admit of its being carried through the opening, which, by its own expansion on the removal of the pressure, it then has a tendency to dilate.

The efficacy of this principle depends somewhat on the part of the trachea to which it is applied, as well as to the mode in which it is carried into practice. It will be at once apparent that dilatation can be made more easily and efficiently in proportion as the amount is small of the structures to be acted upon; and further, that the preliminary puncture can be made with more precision under the same circumstances.

Now in examining the anatomical relations of the trachea, we find that part of it which is most easily reached from the surface, to be also the one at which the smallest danger is incurred from a puncture or incision. It is the part of all others where we find the fewest or least considerable sources of hemorrhage.

On theoretical grounds, then, a happy conjunction of circumstances distinctly points out the top of the trachea as ths most eligible place for the operation.

Practically speaking, after attempting in several ways to effect an opening in this spot on the principle of dilatation, I may now venture to suggest a method which I have repeatedly executed on the dead body, and also performed on the living with great ease, and complete success.

It is an operation which may be considered "*safe,*" because almost bloodless, and at the same time efficient to give relief,—"*easy,*" because

consisting of little more than a simple puncture, and one which *need not occupy more than a minute,* if minutes are precious; but which, when they are not so, may perhaps be advantageously extended to a little beyond that time.

The instrument which I have designed, with the assistance of the Messrs. Weiss, who have admirably carried out the intention, and employed in tbe instances referred to, consists of a broad pair of forceps (something like ordinary dissecting forceps,) but of which a portion of each extremity, about one inch and a half in length, forms an angle with the handle. The points of them are furnished with a fine cutting edge, and the two blades meet accurately, so as to form, as it were, one blade together. (See Figs. 1 and 2.) By their means a puncture, or short incision, is made *transversely* through the skin and cellular tissue, and between the first and second rings of the trachea, so that their cartilages are not *cut or injured in any manner.* The blades being left free in the cavity of the trachea, and held there by the left hand, a screw placed in the handle is turned gradually, by which means the blades separate, and dilate without lacerating the structures around, until the opening is sufficiently large to permit a tube to be introduced. The screw being then turned back, the forceps may be removed, and the operation is completed.

The method of determining the required spot is simple. Let the patient be placed upon his back, his head lying on the same plane with the rest of the body; so that the neck is neither shortened, nor unduly stretched. The operator should sit or stand behind the patient's head, and with the forefinger of the left hand first find the larynx, then passing the finger downwards over the cricoid cartilage, the projection of which may be distinctly felt beneath in the fattest subject, he should with it *define clearly* its lower border, so as to be perfectly assured of its situation, and which it is impossible with ordinary care to mistake.

Then holding the instrument in his right hand, so that the long axis of the blades (which are now closely applied to each other) has a vertical direction, they are to be introduced without force, strictly in the middle line, as near as may be, a quarter of an inch below the inferior margin of the cricoid cartilage, so that they may enter *transversely* between the first and second cartilages of the trachea, or thereabouts. Were the instrument to be applied *immediately* below the cricoid cartilage, it would, in most instances, encounter and perforate the first cartilage of the trachea, because, judging from the examination of the parts in several bodies, I find that the cricoid usually overlaps the latter somewhat, although this is not invariably the case. By introducing the point not more than a quarter of an inch lower down, it will readily slip in between the adjacent rings; the screw is then to be gradually turned as directed above. When the patient is restless and unmanageable, the larynx may be steadied by the unemployed fingers and thumb of the left hand, while the head and shoulders are commanded by an assistant.

As regards the tube to be introduced, a full-sized curved tracheal tube, of moderate length, is, I believe, decidedly preferable to the wire tube; at all events at the time of the operation. It is more easily introduced, is less liable to be clogged with mucus, and there is no fear of its

collapsing from the pressure of the recently-dilated tissues upon it, which cannot be said of the latter. An additional opening about the centre of the tube itself, in its upper wall, is, perhaps, useful as affording facility for the exit of air by the glottis, and so tending to prevent its function from falling into disuetude. (See Fig. 3.)

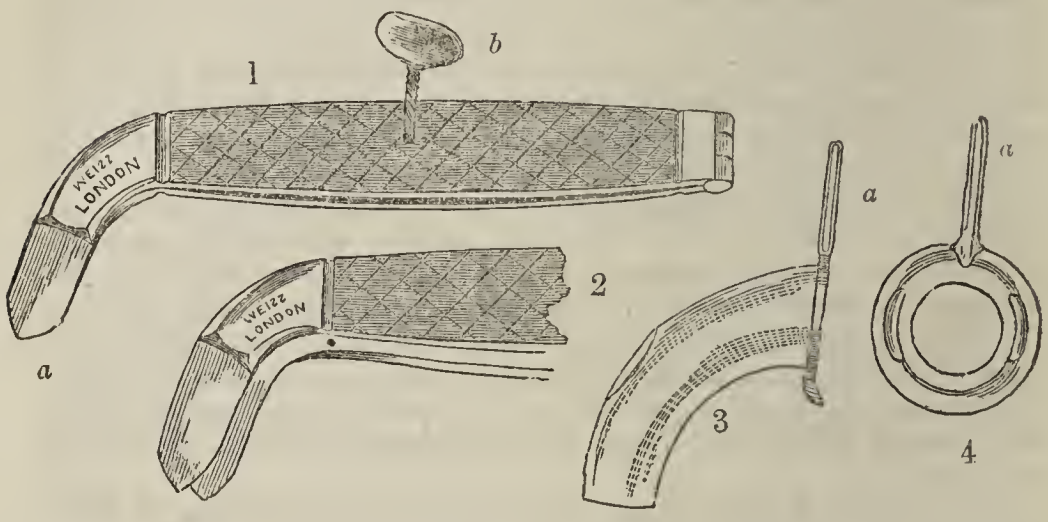


Fig. 1.—The instrument with the blades closed, as for introduction. (Drawn one-half of the actual size.) *a*, the blades; *b*, screw which separates them.

Fig. 2.—The same instrument with the blades separated.

Fig. 3.—Tracheal tube, side view. *a*, a loop of wire, which affords the best means of securing the tube by means of tape in good position.

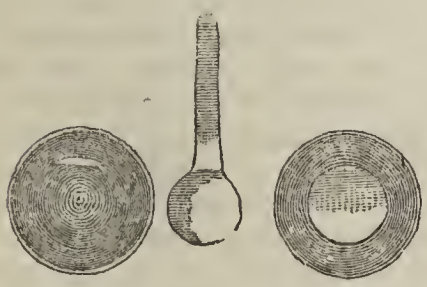
Fig. 4.—Front view of the same tube.

Having been desired by Dr. Marshall Hall, about a fortnight ago, to perform tracheotomy upon a patient suffering from epileptic fits of a most severe form, I adopted, with his concurrence, the plan just described. It was done at that gentleman's house, he, Dr. Russell Reynolds, and Mr. Squire, of the Marylebone Infirmary, who kindly gave me his assistance, being present; and it was observed by Dr. Reynolds that the air rushed through the artificial opening in less than thirty seconds from the commencement of the operation. The bleeding was exceedingly slight, scarcely worthy of mention. In cases, therefore, which require instant relief, it is presumed that this method will be especially applicable. It is, however, not proposed for adoption in the cases of children. The small size of the trachea, as it appears to me, would contra-indicate its employment, at least until the trachea is laid bare in the usual manner, and even then an opening would, perhaps, be more readily made with the knife. Why should not the operation, however, be performed in the uppermost rings of the trachea in such cases, rather than lower down?

Since writing the above, I may be allowed to state that the subsequent condition of the opening in the trachea of the patient referred to has been all that can be desired; no trace of a wound is discernible on examining the neck, simply an opening filled by the silver tube. It is satisfactory also to state that the worst concomitant symptoms of the fits

have disappeared, and his condition generally, physical and mental, is already greatly improved. I may also add that I have had the pleasure of witnessing the performance of the operation with my instrument, by Mr. Lane, of St. Mary's Hospital, about a week since. The patient, a woman, had a considerably enlarged thyroid gland. It was, therefore, thought desirable to make a small preliminary incision through the skin and cellular tissue, just above the isthmus, which was pushed downwards to some extent with the handle of the scalpel, when, without baring the trachea, Mr. Lane inserted the instrument, and introduced a large tracheal tube between its blades with the utmost ease.—*Lancet, March 5, 1852, p. 219.*

59.—*Paracentesis Thoracis.*—An ingenious and simple expedient for preventing the entrance of air into the chest during the performance of the above the operation has been shown to us by Mr. Hutchinson, the clinical assistant at the City of London Hospital for Chest Diseases. It consists in the adjustment of a little flap of soft washleather over the orifice of the canula in such a manner as not at all to impede the exit of fluid, but to act as a valve in entirely preventing the entrance of air.



The mode in which this is accomplish- will be at once seen by a glance at the accompanying wood-cut. The small end of the slip of leather (A) is passed through the chink in the rim of the canula, and the broad portion allowed to hang over its orifice. The leather should be very thin and flexible. Before using, it should be well moistened with warm water. It of course interferes in no way with the fitting of the trocar within the canula. The contrivance is an improvement on that used by Trousseau, who placed a skein of silk over the mouth of the instrument. We think it well calculated to supersede the more complicated instruments now employed for the performance of this important operation.—*Med. Times and Gazette, Jan. 1, 1853, p. 25.*

ALIMENTARY CANAL.

60.—CASE OF HARE-LIP.

Reported by GEORGE YATES, Esq., Resident Surgeon of Queen's Hospital, Birmingham.

[This case was complicated, by a portion of bone projecting between the edges of the cleft, in which two teeth were placed, the whole being covered over by a cherry-like protuberance of integument. As this obstruction interfered with the proper adjustment of the edges of the

wound, it was removed with a strong pair of forceps. The pins were removed on the fourth or fifth day, and fifteen days after the operation the patient was discharged; the wound having quite healed, and little or no scar left. Mr. Yates makes the following remarks:]

Hare-lip may or may not be combined with fissure of the palate, but the two are very frequently found together. The affection always occurs in the upper lip, and it assumes various and frequently even fantastic shapes. The cleft is sometimes simple; frequently, as in Green's case, there is a middle detached portion, and now and then two or more of such prominences. The cause of the disease is not obvious; it is most commonly attributed to an arrest of development; and is sometimes seen occurring in the same person or family, with malformations of the bladder, penis, feet, and other parts. Sometimes the affection appears to be hereditary. Why these malformations occur we cannot say, and the answer generally given to the question—viz., that it is an arrest of development—is no answer at all, but only a statement of the fact itself.

Of course, there is but one mode of treatment to be adopted in these cases; but it is an important question, concerning which there is some difference of opinion, whether the operation should be performed while the child is young, or at what time of life it should be resorted to. Some would perform the operation before dentition commences. Lawrence "thinks it very desirable to remove the defect early on every account." Fergusson appears also to be an advocate for an early operation; but, on the other hand, Sir Astley and Samuel Cooper "recommend that the operation should not be undertaken till the child is about two years old, and has cut its teeth," because of "the liability of young infants to sloughing, diarrhœa, fever, and particularly the danger arising from hemorrhage and convulsions, which latter state is sometimes only to be checked by the removal of the threads, and allowing the original gap to be produced."

The propriety, however, of operation of the age of two years may well be questioned, as a child of that age is generally a very restless being, and not so likely to remain quiet as though only a few months old, nor nearly so readily to be confined and kept in order. Then, considering the dangers of operating on very young children, it would seem most proper that the operation should be put off for some years, or, at all events till such a time as the child may be able to understand the importance of remaining quiet, and aiding the surgeon as much as may be in the after-treatment of the case. The age, therefore, varies at which the operation may with most propriety be attempted, somewhat advanced age being perhaps preferable, next infancy, and lastly childhood. There is one circumstance, however, which must not be overlooked in coming to a determination regarding time, viz., that the fissure of the palate frequently closes of itself after the lip has been operated on during infancy.

The operation, however it may be performed, is intended to bring two surfaces previously ununited together, and for this, of course, an abrasion must be produced; but when there is a middle projecting portion, as happened in the case related, it becomes a question whether it should be

taken away or left, and authorities are not agreed on this subject. Much, of course, must be left to the judgment of the operating surgeon, and it sometimes cannot be decided until the edges of the fissure are pared and approximated, whether it is proper to cut the projecting portion away or not. If the edges of the lip will come together nicely over the projecting portion, and without too much stretching, it may then be advisable to leave the part, especially as in some cases the contour of the face would be improved by such proceeding; but if it causes stretching of the parts, and projects more than is convenient, removal must be accomplished, care being taken not to cut away too much, lest falling in of the lip occur. Cooper says, "When the jaw itself projects, the common preliminary step to the operation consists in cutting away the bony prominence." Chelius also gives the same opinion. Fergusson, however, is adverse to removing the part totally; and Desault also objects to the proceeding, "the measure being seldom proper" in the opinion of this latter authority, who prefers "reducing the projection of the jaw by means of the pressure of a tight bandage," or, as in a case related in 'Cooper's Dictionary,' the projecting bones may be pushed backwards by means of a "spring truss, worn daily for several hours." Of course, these means are to be put in requisition some time before the actual operation; but they must be both tedious to the surgeon and irksome to the patient, and the writer cannot see that they are preferable to a slight use of the forceps or bone nippers. Gensoul, however, recommended the bending back of the projecting portion, and Mr. Haynes Walton has put the recommendation in practice with success, by partially dividing the projection, and then pressing it backwards.—*Med. Times and Gazette, Nov.* 27, 1852, *p.* 542.

61.—CONTRIBUTIONS TO THE SURGERY OF RUPTURE.

By JOHN GAY, Esq., F.R.C.S., Surgeon to the Royal Free Hospital.

[Mr. Gay proposes to inquire into the merits and demerits of returning the parts, in a case of strangled hernia, into the abdomen—with and without division of the stricture. So long as four years ago he proposed to the profession a new plan of operating in these cases, and he believes that if a reverse of the ordinary line of practice were followed, there would be a considerable saving of human life. The effects arising from a strangled condition of a portion of intestine would quickly subside, if the constriction was promptly and effectually relieved. After referring to a table of strangulated cases in the 'Guy's Hospital Reports' by Mr. Poland, Mr. Gay proceeds,]

It is evident that but little confidence can be placed in the best efforts at manual reduction of the parts in cases of strangled hernia, apart from division of the stricture; whilst, on the other hand, the evil effects of the force used, as well as of the protracted constriction which its employment necessarily occasions, give rise to an amount of fatality that fearfully counterbalances the presumed advantages of its being occasionally successful. The truth and importanec of these observations are well

attested by the following extract from Mr. Hancock's interesting and able work on Hernia:—

"Between the years 1834 and 1839, M. Boyer never operated until he had made prolonged attempts at reduction, and during that period nine cases were operated upon, of which eight died and one recovered. From 1839 to 1843 he employed the taxis to a much more limited extent. Seven cases were submitted to operation, of which four died and three recovered. From 1843 to 1846 he had almost entirely abandoned the use of the taxis; and out of fourteen cases upon which he operated, four died and ten recovered. Mr. Manee, on the contrary, during the same period, almost always proceeded to operation without employing the taxis. *Out of twenty-eight cases operated upon, two died and twenty-six recovered.*"

But the results of the taxis are often disastrously fallacious, as Mr. Cock, Mr. Teale, and others, have, in common with myself, observed. Not only has the sac with its strangled contents been together returned within the abdominal or pelvic boundaries, but it has frequently happened that a portion of the fluid contents of the sac, or of the intestine, has been forced back beyond the seat of stricture; the patient has been relieved, and the surgeon has been led to entertain a hope that the urgency of the case is at an end. A few hours, perhaps a night, have been allowed to pass, the symptoms have recurred with greater severity than ever, and, despite of the release of the parts by operation, the life has been lost. What, then, should be the rule of practice? Clearly, that in cases of strangled hernia the parts should be freed without the least possible delay; and by the use of those means which give the greatest promise of success. Is a trial of the taxis justifiable in any cases? 1st. Clearly not in those in which, however recently the contents of the sac might have become strangled, symptoms of constitutional disturbance have developed themselves; 2nd. Neither in those in which, from the existence of local pain or tension, we infer the encroachment of those lesions which, if unchecked, must prove fatal, and that possibly in the shortest space of time; 3rd. Nor in those cases in which strangulation has been protracted beyond a few hours, seeing that of all the circumstances that are known to compromise the safety of the patient, none is more insidious, more replete with peril, than delay.

[The taxis should only be employed under chloroform, and that only with very gentle efforts for a few minutes. In the meantime, the friends should be warned of the danger; so that if the taxis fail, the operation may be proceeded with at once. Mr. Gay then goes on to say:]

For a case of strangled hernia, then, there is but one remedy on which the surgeon can depend—the division of the stricture. This is no discovery of mine; it has again and again been reiterated, but every day's experience, and the revelations of practice in the various journals, show that the doctrine is still far from being generally believed in; or if believed in, is not acted upon. The rule of practice which appears very generally to prevail, even at this moment, is, as I have already observed, that it is better to reduce the parts by any other method than

by an operation; and that consequently this should be delayed until every other shall have proved futile.

The fact is, a very strong and general antipathy exists against the operation abstractly; and probably by those who have a lingering impression on their minds of the large incisions, the tedious dissections, and the wholesale exposure of parts which its performance some years since was wont to involve, this antipathy might be entertained with some considerable show of reason. It is not, however, warranted by the more than necessarily elaborate mode of dividing the stricture, which was adopted in the time of Pott and Hey; for these surgeons averred, that the operation, if well done and in due time, did not prove the cause of death once in fifty times. Even now the usual operation has many defects; and in order to remove the prejudice referred to, it appeared to me, that in its place a mode of dividing the stricture was required, which should be simple of execution, free from danger, and still effective for all purposes; a method which should claim to be preferred to all other methods of effecting the reduction of a strangled hernia.

The defects of the old operation are—that (if I may so express it) it is too anatomical, and not sufficiently surgical: and that in securing a very simple end, it is too prodigal of the means. The knowledge and skill required for its performance have not only served to lull all suspicion as to the actual necessity of so elaborate a procedure, but have so captivated as well the aspiring student as the practised surgeon, that its real elements of danger are commonly looked upon as its greatest charms. The simple objects of the operation should be, of course, the division of the stricture, wherever situated; the method, that by which a knife can be brought most readily to bear upon it. According to the old operation in femoral hernia, the form and the extent of the preliminary incisions are to be determined by the size and shape of the hernial tumour; but what relation these latter circumstances have to the seat of stricture, so as to necessitate such a modification of the operation for its division, I cannot divine; seeing that under every conceivable condition of the tumour, the seat of stricture, according to the variety of hernia, might be, and is for the most part, the same. This, and other unintelligible absurdities appertaining to the method referred to, quite suffice to account for, if not to justify, the dread that has generally been entertained with respect to it.

The method of operating to which I have called the attention of the profession is, I believe, free from these objections. By it the seat of stricture it reached through a small wound made in healthy structures, immediately contiguous to the neck of the hernia, and so as not in any way to interfere with or disturb those parts of the protrusion not directly implicated in the act of strangulation. It has nothing to do with the size, shape, or even direction of the tumour, for it deals with the stricture, and with that alone, so long as that comprehends the seat of the mischief; whilst, at the same time, it allows of any modifications that extraordinary circumstances or conditions may in the course of the operation be found to demand. It is not, as some have alleged, a species of subcutaneous section, for the whole process may, if required, be distinctly

seen; although, with a moderate aquaintance with the anatomy of the region, the sense of touch is alone necessary for its execution.

I have now operated according to the plan advocated many times, and have only had to repent of the use of the taxis and of delay. In favourble cases, where the stricture has been outside the sac, the operation has only taken from one to a very few minutes for its performance; whilst the recoveries, in comparison with those after the old operation, have been, on an average, as seven days to thirty. The operation has been, I am pleased to learn, adopted by several of our leading surgeons, but it is not without the utmost gratification that I extract the following remarks from a clinical lecture by the distinguished professor of surgery at King's College; for not only do they confirm the opinion I have never ceased to entertain of the method of operating which I have advocated, as well as of the principles upon which it is based; but, coming from so high an authority, and after so long and deliberate a trial as that which Mr. Fergusson has done me the honour to give to my views, they abundantly justify me in still claiming for them the serious attention of my professional brethren.

Mr. Fergusson says, after giving a very clear account of the method of performing this operation: "Now this I consider a most simple proceeding, ... and I think it deserves much more attention than it has already obtained at the hands of practical surgeons. I have for the last few years rarely performed any other operation. The incision in the skin admits of the sac being opened or not, as may be found advisable. I feel certain that those who see this operation performed, will confess that there is some advantage over that which is usually done, both from the facility with which it is accomplished, and from the simple aspect of the whole process. I shall avail myself of other opportunities of calling your attention to this method, as I deem it worthy of your careful consideration; in fact, I should not be doing my duty as your teacher, if I did not bring before your notice what I myself deem a very great improvement in connexion with hernia, as the proceeding referred to is really not much more than the simple operation of the taxis.—*Lancet, Nov.* 20, 1852, *p.* 466.

62.—*On the Operation for Crural Hernia.* By William Fergusson, Esq., F.R.S.—[Having performed the operation for the relief of this form of hernia after the simple manner recommended by Mr. Gay, Mr. Fergusson thus expresses his opinion of its value.]

I consider it a most striking improvement in the operation for hernia, giving it a character little less formidable and difficult than the taxis; and, of late years, I have done hardly any other operation but this. There can be no doubt that a cutting operation is required every now and then in instances of strangulated hernia, notwithstanding that certain enthusiasts of very limited experience—men who, perhaps, have only seen fifteen or twenty cases of the disease in their lives—have tried to prove that it is hardly ever necessary; and, when it is required, it is

best and safest to practice the operation in the simplest way possible, such as may be nearest to the taxis. This was the feature in the proceeding devised by Petit, consisting in returning the hernia without opening the sac. Mr. Gay, however, has made the process even still more simple, for he hardly meddles with the body of the tumour at all, and divides but little of the skin. In modern surgery, it is a remarkable feature that we divide tissues extensively without wounding the skin more than by a simple puncture. You may recollect seeing me divide subcutaneously the whole of the deltoid muscle, in a remarkable case of luxation of the head of the humerus, although I only made the smallest possible opening in the skin.

This principle is, to a certain extent, carried out in this method of operating for strangulated hernia, for only a very short cut is made through the superficial tissues, and the knife is readily inserted through this opening and carried to Gimbernat's ligament, which generally constitutes the stricture. Of course the operation will not suffice in every case, for every now and then it will be necessary to open the sac, in order to look at its contents, when there is reason to believe that the intestine is in a condition not fit to be returned. In cases, however, where the patient is seen early after the strangulation, it may not be necessary to open the sac, for the more simple the proceeding the better it is, and I have now alluded to this case particularly to point out to you again the superiority of Mr. Gay's mode of operating.—*Med. Times and Gazette, March* 12, 1853, *p.* 263.

63.—CASE OF STRANGULATED HERNIA.

Under W. Fergusson, Esq., F.R.S.

[Harriet Otley, aged 35, was admitted into King's College Hospital at 11 o'clock on the morning of the 14th of October, with a strangulated crural hernia on the right side. The symptoms had commenced a week previously, and the medical pratitioner who had treated the case not only did not discern the hernia, but had given strong purgative medicines for five days, without relief. On admission she was placed in a warm bath and the taxis applied. The tumour was returned but the pain was more intense than before. At three o'clock p.m., as the symptoms had not abated, Mr. Bowman, in the absence of Mr. Fergusson, determined to explore the tumour. The tissues outside the sac were found to be of a very dark colour, and gave off a very fetid smell. The sac did not contain any intestine; no obstruction being found; the wound was closed, but the patient gradually sunk at 4 a.m. on the 15th.]

On making a *post-mortem* examination, the whole of the intestines were found inflamed and covered with a film of lymph, which glued the opposite surfaces of the contiguous coils together. This was more particularly apparent in the small intestine. About six inches of the ileum, which had been confined within the hernial sac, were in a gangrenous condition; and in the middle of the gangrenous portion, at the free border of the gut, was a hole about 1-12th of an inch in diameter,

through which feculent matter had escaped. Above the gangrenous portion was a mark of constriction, showing where the gut had been strangulated. The hernial sac was about the size of a pullet's egg, and was gangrenous. The pelvis contained some turbid serum having a fæculent odour.

Now, in this case are presented some features of very great interest and very worthy of your attention. It will be seen that, when the woman was first admitted, the taxis was employed, and the hernia was reduced into the abdomen. When such a circumstance has been effected, we naturally look for an amelioration of the symptoms which had been produced by a hernia in a state of strangulation. No such improvement was manifest here, but, on the contrary, matters continued in the same state as before, or, rather, were aggravated; and Mr. Lawson began to conjecture that he might have ruptured the intestine, although he had been careful in not using any violent pressure. He was more inclined to fancy this from the fact of the patient feeling a sudden increase in pain after the gut had been reduced; and we know such is the symptom after rupture of the intestine has taken place. However, this accident is so rare in the hands of a careful man, that we seldom calculate upon its occurring; and in this instance, so little pressure was used that it was hardly possible to account for it in this way. The taxis had not been employed before, for the case was altogether overlooked by the practitioner who had attended her. In this respect it is similar to many, I am sorry to say, which we have opportunities of seeing. It has occurred to me to witness many cases where most extraordinary ignorance or carelessness had been displayed. I have seen blisters placed upon the abdomen to relieve inflammation, when, at the same time, there has been a large tumour in the groin. I do not mean to assert that in every instance where a hernia has been overlooked, the practitioner is to be blamed, for I have known cases in which persons even of tact might well be deceived.

[If, in this case, the hernial tumour had been immediately cut down upon, and the gangrenous portion divided so as to form an artificial anus, there is just a possibility that the patient might have been saved. But then it could not be known that the intestine was in that condition until after death. Mr. Fergusson concludes:]

This case, which is a melancholy instance both of the carelessness and ignorance which is exhibited by some practitioners towards their patients, is another strong proof of what I have often before stated to you—viz., that in every case of strangulated hernia a careful attempt with the taxis should be made, and that, if it does not succeed, an operation for the purpose of dividing the stricture should be resorted to as soon as possible. In no one instance of surgical disease is delay or improper treatment more dangerous, and you can never have a more striking proof than is exhibited in the unfortunate case which has called forth these few remarks.—*Med. Times and Gazette, Nov.* 20, 1852, *p.* 507.

64.—*Mechanical Support in Prolapsus Ani.* By JAMES DEANE, Esq.—[In the case which Mr. Deane relates, prolapsus had existed for sixteen years. The patient was a female, aged 25. On examination, external piles were found, and a fold of integument encircled the anus, to the extent of three-eighths of an inch. Internal piles also existed, with a rugose and puckered state of the lining membrane of the bowel. The external piles, and the fold of integument, (no doubt originally protruded mucous membrane) were removed by excision, but with not the slightest benefit to the prolapsion. The following plan, however, was adopted, with the utmost possible success.]

The plan may be described thus:—Cover a chamber utensil with a strong flat board, taking a circular form, and projecting one inch; let into the edge of the wood three or four pieces of wood, to keep it fixed on the chamber-pot; make an opening on the surface of the board, a little behind its centre, just large enough for the anus to act; and surround this opening with an elevated ridge, to support the entire perineum and sides of the anus during evacuation. The anal foramen which I have used, has been oval, its long diameter being antero-posterior, and four inches in length, and its transverse diameter being two inches and a half. It has been abrupt, not bevelled; the sharpness of the edge being removed. The ridge has been half an inch high, and has extended all round the anal foramen, and has been less than half an inch from it. The great object is to keep it within the ischia. Some of my patients have felt more secure and more comfortable *with*, and some *without* this ridge. For females, I have had a large anterior urinary fissure, half an inch wide towards the middle of the board, and opening into the foramen, and gradually enlarging forwards to the size of three inches in front. With males, I have recommended another utensil in front.

[We suspect that many if not most of such cases as this, are not real prolapsions of the anus, but only of the internal membrane of the rectum,—very often with hemorrhoids attached to it, or perhaps a vascular nævus which bleeds profusely. In such a case, the application of nitric acid to the prolapsed portion is valuable; it causes a portion of it to slough away, and the whole part becomes narrower and stronger. Prolapsus ani is in this way frequently cured.]—*Association Med. Journal, Jan.* 14, 1853, *p.* 34.

65.—*Fistula in Ano.*—M. Alquié ('Gaz. des Hôpitaux,' No. 48,) states that he has found it a very beneficial practice to cauterize the lips of the wound by means of nitrate of silver, after the incision of fistula, premature adhesion being prevented, without the necessity of interposing tents, lint, or other material. The nitrate should be applied, but only to the lips, twenty-four hours after the operation, and repeated first every, and then every other morning. He was led to the practice by observing the condition of wounds when touched by the nitrate. The pellical or superficial eschar is eliminated in a day or two; the surface so

covered being unsuited to contract adhesions. This covering also enables the wound to tolerate the presence of the intestinal discharges which pass over it. Most persons complain little of the pain caused by the application; but in some cases it is severe.—*Brit. and For. Medico-Chirurgical Review, April* 1853, *p.* 572.

66.—CASES OF HEMORRHOIDS TREATED BY NITRIC ACID.

By Dr. William Cooke.

[The following cases are illustrative of the value of nitric acid in this painful and tedious affection.]

Case 1.—In May, 1848, I was consulted by a gentleman, of a highly nervous temperament, relative to what he had considered a prolapsus of the rectum. The protrusion only took place on his having relief from the bowels, but he then suffered great inconvenience for a considerable time, the distress not ceasing until the protruded parts returned within the sphincter.

Taking a favourable opportunity for examination, I found that the protrusion did not consist of the bowel itself, but of hemorrhoids, two of them the size of large walnuts, and one or two smaller. As the patient had to make arrangements to withdraw from important duties while under treatment, he wished a consultation, that the most decisive measures should be adopted. At this consultation it was suggested and agreed that nitric acid should be applied.

May 18.—I directed that opening pills should be taken at bedtime, and an aperient draught early in the morning, for the purpose of bringing down the diseased parts as fully as possible. Having accomplished this, I applied strong nitric acid, by means of a mop of lint on the end of a slender wooden handle, mopping the surface of each pile fully. It was important to have ready, as had been suggested, some liquor potassæ and a dossil of lint, in the event of any acid touching the healthy skin. The pain, for a short time, was severe; but, after waiting about a quarter of an hour, the parts were replaced by pressing them up with a compress of lint. An anodyne draught was given at bedtime, and a good night secured.

At the end of a week, I did not think the effect produced was sufficient. The piles were much hardened, as if blood had coagulated densely within them; but some parts of the covering appeared to retain vitality. I repeated the application, and, as the parts were now less sensitive, I inserted a tenaculum, and drew them down more than at first. Although well mopped, the pain was not so severe as at first. An anodyne was given at night, and an aperient after the lapse of two or three days. A little sloughing took place, but very little pain was suffered. Soon nothing came down. and in about three weeks the gentleman considered himself well, and has continued so.

Case 2.—A stockbroker, about 48 years of age, who had suffered for some time from piles, which not only annoyed him by their protrusion,

but they often bled copiously. He applied to me in the summer of 1848, and used various remedies without effectual relief. The affection was not nearly so severe as in the preceding case, but it was enough to make him exceedingly uncomfortable.

In October I applied nitric acid; the pain was inconsiderable, and one application sufficed. He remained from business only two or three days, and had no return.

Case 3.—In May, 1849, I was consulted by a lady whose health had suffered greatly from external and internal piles of considerable size. They often bled, and frequently became inflamed, when, as usual, walking was attended with much pain. Some of these hemorrhoidal swellings constantly existed, others protruded at the time of an evacuation of the bowels, and occasioned severe distress, until they were returned within the sphincter, and this was not unfrequently delayed for some hours.

This patient lived seven miles from town, but came to the house of a friend on the 24th of May, to receive my visit, and, considering the state favourable for an application, it was proposed to her. Although she consented, it was with great terror, and, on the slightest touch, she made violent shrinking efforts, and drew the protruding portions beyond reach.

On the 29th, she again came to town, and, having suffered but little pain from the preceding application, she had gained courage, and the circumstances were now favourable for a more extended application.

June 4.—The affection had nearly disappeared, but, as coming to town was inconvenient, the acid was re-applied, and, in a fortnight, I was informed that she was quite relieved.

Some pain, of course, attended each application, but it was of short duration; and, after waiting about ten minutes, the portion usually retained within the rectum was gently passed beyond the sphincter, and ease was experienced. The patient was not only relieved of local pain, but her long and severe suffering had acted powerfully on her general health, which now remained good.

Case 4.—The Rev. Dr. G. had for many years been subject to hemorrhoidal losses of blood. The loss at times had been rather profuse, and, being a weak and nervous man, and the hemorrhage commencing when he was but a young man, it had contributed to prevent the development of physical energy. He became settled as pastor of a congregation, and married an interesting and amiable young lady; but, although having a cultivated mind, and everything to make his position honourable and useful, yet a false conviction of moral inadequacy rendered him very unhappy. His morbid excitability, the weakness and perturbed state of his nervous system, extended to his conjugal life, and entirely prevented his enjoying it. Such was his nervousness, that he felt quite unable to consummate marriage, but he was subject to frequent emissions. He was a man of scrupulous moral propriety, was concerned for his wife's happiness, and, though fully aware that he suffered from physical causes, he grieved not only for himself, but for the amiable person to whom he had become united, and reproached himself severely for having married. He resigned his ministerial office, and opened a

classical school; and, after a few years, he had gained a somewhat better state of health, and resumed the ministry. He still remained highly nervous, was a sufferer from his early enemy,—piles and occasional hemorrhage,—and never could conquer his conjugal infirmity.

These melancholy details are premised for the purpose of showing to how great an extent the general system may suffer from the local affection in question; but the patient himself, in his prevailing tendency to indulge in self-reproaches, ascribed a good deal to the indiscretion of early puberty.

In 1849, when he was probably about 45 years of age, he consulted me in especial reference to his piles. I made examination immediately after he had passed fæces. The protuberances were of considerable size—two as large as walnuts before denuded of their green husk—others smaller, and a number of excrescences surrounded the anus. As he was then residing at a distant part of the country I proposed that he should take lodgings near me, in which he concurred.

On Oct. 20th I made the first application, mopping the surfaces well. The pain was considerable, but did not last long. As the disease had existed so long, and was so considerable, the application was repeated twice at intervals of a few days. The pain lessened each time. Sloughing took place, accompanied with a dark and offensive discharge, and no protrusion now occurred. On the 30th I cut off the small pendulous excrescences, and in a few days he was quite well. He remained free from protrusion and hemorrhage.

Case 5.—Captain B., of the merchant service, consulted me in March 1850, respecting a severe dyspeptic state in which he returned from a voyage of seven or eight months. He had suffered much on the voyage from constipation, want of appetite, debility, losses of blood per anum, and protrusion at the time of passing fæces. His appearance was very delicate, quite unlike that of the weather-beaten mariner. Attention was first directed to general treatment by aperients, bitters, and regulated diet, and by which, and the kind attentions of his wife, and the comforts of a well-regulated home, his health became much improved. On the 18th of March he discontinued medical treatment, except as to the occasional use of an alkaline aperient. It was agreed, however, that, before he started on another voyage, I should have an opportunity of examining what he called the "bowel coming down," from which he had loss of blood occasionally, and much inconvenience after each dejection. He was so busily occupied with the duties of his ship, that no appointment could be made until the 27th March, when, having taken an aperient medicine over night, I ascertained that the protrusion consisted of piles, two of them presenting on one side of the anus; their surface looked very irritable, and their was a slight sanguineous oozing from it. As all things were favourable, I applied the acid well to the surface of both the protuberances. The pain was severe for fifteen or twenty minutes, during which time the parts were allowed to remain external; then, by means of a compress of lint, I passed them into the rectum, and the pain subsided. An anodyne draught was given at night.

On the 28th I found him quite easy, and the bleeding and protrusion

ceased. Very soon afterwards he started on his voyage, provided with instructions and means to counteract constipation and also bleeding, should it recur; but on his return, some months afterwards, he reported that he had suffered no inconvenience during the voyage; his bowels had generally been regular, and his health good.

Case 6.—A gentleman, about 36 years of age, married, and having a family, and engaged largely in business requiring activity, became the subject of what was considered prolapsus ani. Always after relief from the bowels he suffered considerably, and occasionally the protruding part became inflamed, when surgical assistance was required. He had been advised as to various plans of treatment, but none had been successful in curing the disease. At length the sphincter lost, to some extent, the power of controlling the parts, so that they would sometimes descend by a sudden muscular effort, and occasion great inconvenience. Under these circumstances, the patient had recourse to a supporter, the pad pressing rather strongly on the anus. The instrument was very well made, and answered its design, keeping the patient tolerably comfortable so far as exercise was concerned; but it was still a formidable thing to have relief for the bowels. On account of the proceeding it required, and the length of time during which uneasiness remained, it was usually sought in the evening, when business was over. Warm water and a soothing or astringent lotion were required. The protruded part was sometimes irritable, and not unfrequently bled. It was often necessary to wait a considerable time before the part could be returned, and the instrument applied.

I had known for some years of the existence of this gentleman's trouble, but was not specially consulted about it until 1851. At the end of July he requested my advice. It was not in this case necessary, as in some others, to give opening medicine to bring the offending parts into view, for, on the removal of the instrument, a little straining brought them fully down. The surface of the protruded part was nearly as large as the palm of the hand,—three, if not four inches in diameter,—made up of a cluster of hemorrhoids,—some large, others small; some parts red, and others livid. The mass stood out prominently. In its inequalities and form it gave me much the idea of a large love-apple. The gentleman was willing to undergo any measure I would recommend, and had familiarised himself with the means commonly used in the extirpation of these affections,—viz., excision, ligature, and caustic,—and required me to discuss with him the advantages and disadvantages of each. For reasons it is needless to detail, the latter form of treatment was preferred.

On the 1st of August, with the aid of my son, Dr. W. M. Cooke, the nates being well separated, I applied very concentrated nitric acid to the whole surface. The pain was very severe, of course, and continued for fifteen or twenty minutes. I then carefully returned the parts, and the patient went to bed and took an opiate. His bowels remained quiet for two or three days, and on having relief only a small protrusion occurred. On the 6th, he took a rhubarb and magnesia draught, and some sloughy and bloody matter accompanied the motion. Slight irritative fever with sickness ensued, and was relieved by effervescing medi-

cines. At about the end of a week there was considerable discharge, and for two or three days slight erysipelatous inflammation surrounded the anus; poultices were applied. At the end of a fortnight acute pain was felt beneath the point of the sacrum and coccyx, and after a day or two a swelling presented at the posterior part of the anus. Fluctuation became perceptible, and the swelling was punctured, and there flowed out about two ounces of a most offensive mixture of pus and blood. Tonics were now prescribed. The discharge from the abscess continued for two or three days, gradually losing the fetid odour. From this period no inconvenience, except debility, was suffered. At the end of the month the gentleman went to Dover, partly to expedite the recovery of strength, but in part to superintend works in progress. No inconvenience has since been suffered, and, of course, as there was the non-necessity of artificial support, the use of the instrument was most gladly avoided.

Some doubt has been entertained whether the acid acted by coagulating the blood in the pile, or by producing sloughing of the coats. In the more severe of the preceding cases, it was evident that partial destruction took place; in the milder cases that result was doubtful, in consequence of there being no opportunity of subsequent examination.—*Med. Times and Gazette, April* 2, 1853, *p.* 343.

ORGANS OF URINE AND GENERATION.

67.—CASES OF STRICTURE.

Under John Hilton, Esq., F.R.S.

[In the first case Mr. Hilton relates that the patient was a married man, 43 years old, who affirmed that he had never had gonorrhœa or syphilis, and thought that his stream of urine had always been smaller than in most men. He had previously suffered a similar attack, which was relieved by leeches, warm baths, and catheters. About five weeks before admission he suffered under another attack; and all the attempts to pass a catheter by his medical adviser had failed, though zealously repeated. Warm baths and other measures now failing to give any relief,]

At nine, p.m., unsuccessful attempts to draw off the water were made by the dresser and assistant-surgeon, these attempts being followed by urethral bleeding. A large dose of opium and a hot bath were ordered. At one o'clock the patient was seen by Mr. Hilton. The symptoms being in no way relieved, another dose of opium was administered, and at three in the afternoon of the 24th of February (the day of admission), as no catheter could be passed into the bladder, Mr. Hilton punctured that viscus through the rectum with a long trocar and canula, and drew off seventy-two ounces of dark-coloured urine; the canula, secured by tapes, being left in the bladder. Two grains of powdered opium were then ordered. The relief was immediate, and the patient expressed himself as feeling considerably better.

Feb. 25th, (second day.)—He passed a good night; the febrile symptoms have disappeared, and the man is quite easy and comfortable.

Feb. 27th, (fourth day.)—The bowels have not been open since the operation; the patient complains of tormina, and thinks that he could have a motion if the canula were removed. All the urine flows by the latter, none through the urethra, and pressure on the lower or any portion of the abdomen gives no pain. Pulse 80; tongue clean and moist; appetite good. Ordered, five minims of nitro-muriatic acid, fifteen of tincture of hyosciamus in infusion of cusparia, every sixth hour; one ounce of castor-oil to be taken immediately.

Feb. 28th, (fifth day.)—The bowels were opened five times very soon after taking the oil; no appetite; the tongue is white and moist; pulse 84. There is very slight tenderness over the region of the bladder, but no peritonitis; the canula still lies in the rectum and bladder, and a stopper is used to prevent the constant dribbling of urine; the stopper is, however, removed when the patient desires to make water.

March 3rd, (eighth day.)—The bladder has been washed out, and the water returned quite clear and inoffensive; the patient can retain his urine for five hours at a time. General and local symptoms are going on harmoniously well.

March 7th, (twelfth day.)—Mr. Hilton introduced a very small flexible catheter along the urethra into the bladder, and allowed it to remain with a plug, to be removed when the patient wishes to pass urine. He feels very well; the appetite is good, and the bowels freely open, the canula being still in the rectum.

March 8th, (thirteenth day.)—Mr. Hilton exchanged the small flexible catheter for one of larger size, and allowed a pint of porter.

March 12th, (seventeenth day.)—The canula was this day removed, and was found to be encrusted with urinous deposits; the catheter is still kept in the urethra and bladder, and the patient can hold his urine for four hours at a time. He feels very well, and is improved in his general appearance.

March 19th, (twenty-fourth day.)—The patient has continued to progress favourably; No. 6 catheter goes into the bladder easily, and he was discharged in a much better condition than was usual with him.

Here you will be pleased to notice that the canula was left sixteen days in the bladder, and when removed there was no subsequent escape of urine into the rectum. On comparing the relative length of time required in this patient's case, to produce an equal degree of relief by the two kinds of treatment—viz., catheterism in his first, and puncturing through the rectum in his second attack—you will find, in addition to suffering a good deal by pain and loss of blood in carrying out the first plan, six weeks were necessary for its accomplishment; whilst, in the second instance, the good results were arrived at on the 23rd day of treatment, the canula being removed from the bladder at the end of sixteen days.

If you ask now how long the canula ought to be left in the rectum, I shall answer, until the urine passes freely and voluntarily through the urethra, and until a catheter may be passed through that canal.

[In the second case the patient, also a married man, was admitted Oct. 13, 1851. Twenty years ago he had suffered from gonorrhœa, which had left a gleet for some time. The complaint, however, seemed to have originated, about eight years before admission, in a fall, by which the testicles and perineum were wounded. Ever since he has had difficulty in passing water. About half-past six on the morning of the 13th, he found complete inability to void his urine, without any apparent cause. Serious symptoms soon coming on, he sought the hospital, he was placed in a warm bath, and two grains of opium given him. Two hours after, catheretism was attempted, but totally failed, the patient losing from two to three ounces of blood at each operation.]

In consequence of the patient's great distress, Mr. Poland, being on duty for Mr. Hilton, determined to puncture the bladder per rectum.

He was therefore placed at the edge of the bed, with the pelvis raised by a pillow, and the legs fixed as for the operation of lithotomy. On passing the index-finger of the left hand into the rectum, the posterior-edge of the prostate gland could not be distinctly felt; the trocar and canula were, however, introduced, and made to puncture the bladder through the walls of the rectum. Three pints and a half of urine were evacuated, the fluid being of a dark, coffee-coloured appearance, and of scarcely any odour; the patient felt immediately relieved.

On adjusting the second tube with the tapes, the canula was accidentally drawn out of the bladder. Mr. Poland thereupon endeavoured to find the opening with a director, but did not succeed; it was, however thought that probably, when the bladder became distended again, the urine might make its way through the opening, and that it could then with facility be found. This did not, however, take place for twelve hours after the operation. The distress of the patient was so great from distension of the bladder, that it was found expedient to puncture that viscus again, the suffering being greater than on the previous day.

The trocar was then introduced *de novo,* and about three pints of urine mixed with blood escaped. Two grains of opium were given at once, and were to be repeated the next morning.

Oct. 15th, (third day.)—Feels very comfortable; tongue furred; pulse 80, full and hard; no headache; some thirst; moist skin. Has slept very little in the night, not from any pain, but because he is not accustomed to sleep on his back. About forty ounces of urine have been passed through the tube during the night; the renal secretion is tinged with blood, and alkaline.

Fourth day.—Pulse small and wiry, about 90; tongue furred, but moist; the countenance is more anxious, but there is no pain. Since yesterday, at ten o'clock, about sixteen ounces of reddish-brown, fetid, and ammoniacal urine, of specific gravity 1·30, has been passed. The fluid is very turbid, and there is a copious flocculent deposit, partly dissolved by heat. Eight ounces of wine per diem were ordered.

Fifth day.—The patient does not feel so well to-day; the tongue is much injected, purple at the edges, and furred in the centre; pulse increased in frequency, and weaker; a quantity of turbid ammoniacal urine has been passed through the canula; the renal secretion is much

thicker than yesterday, and more fetid. As the bowels had not been relieved since the operation, two pills of calomel and colocynth were ordered, with one ounce of castor-oil in the morning.

On the sixth day there was much improvement; the bowels had been relieved several times, and urine had come several times through the meatus, which caused a severe scalding pain along the urethra. A mixture of acetate of ammonia, with powdered rhubarb, was ordered, and the opium was to be continued at night.

Seventh day.—Progressing favourably; appetite improved, and the patient feels much stronger.

[On the 5th of November this patient is stated to have perfectly recovered.

After detailing another case of a similar nature, in which the bladder was punctured through the rectum with perfect success, Mr. Hilton concludes thus:]

Let me now, in a few words, place before you the objections which have been brought against an operation, the useful application of which these lectures have been intended to exemplify.

1st. It has been alleged that there is great danger of wounding the peritoneum and of causing peritonitis; but you know, at present, that in puncturing the bladder through the rectum the peritoneum is not wounded at all.

2nd. Wounding the vesiculæ seminales or the vas deferens. The experience of Guy's Hospital shows that this accident happens very seldom, and when it does occur it is not of much importance.

3rd. It is objected that it is very difficult to retain the instrument in the bladder and rectum, but this apprehension need not be entertained, for you have seen how steadily our patients now retain the canula in the rectum, thanks to the improvements in our instruments.

4th. The operation is opposed. because a communication between the bladder and rectum may persist for an indefinite period. This, indeed, may happen, but is very rarely the case. Indeed, I may safely say, that most of those who uprightly and without prejudice find fault with the operation, are but very imperfectly acquainted with the actual results of the numerous cases which have thus been treated. Between twenty and thirty operations of this kind have been performed in this hospital within the last few years, with a success as to result the most encouraging; and I doubt whether a like success could have been attained in cases of equal severity by any other mode of treatment; and that, after all, is the important point for our consideration.

If the operation of puncturing the bladder through the rectum be, as I believe it to be, devoid of most of the dangers which have been, perhaps, only theoretically attached to it, and also free from many of the dangers and difficulties of the other or substitute operations, it is surely time that surgeons should give it more consideration and more credit for good on its own merits than it has received of late years.—*Lancet, Nov.* 20, 1852, *p.* 460.

68.—ON THE SOLUTION OF URINARY CALCULI IN DILUTE SALINE SOLUTIONS, AT THE TEMPERATURE OF THE BODY, BY THE AID OF ELECTRICITY.

By Dr. H. Bence Jones, F.R.S.. (Read before the Medical Society).

This paper contained the record of a number of experiments made to determine whether, out of the body, urinary calculi could be dissolved by placing them in dilute solutions of nitrate of potash and other salts, and then decomposing the solution in contact with the calculus by means of the galvanic battery. The urinary calculus was carefully dried and weighed, then fixed between the poles of a galvanic battery, after which it was immersed in a solution of nitre, and at the end of the experiment it was re-dried and re-weighed. The loss of weight gave the effect which was produced. The different calculi which had been used were also exhibited, showing the different degrees in which the various kinds of urinary calculi are dissolved when submitted to this treatment. The conclusions at which the author arrived may be thus stated: In a solution of nitre containing twenty grains to the ounce, kept at the temperature of the body, uric acid calculi can be dissolved by the aid of electricity, at the rate of from two to nine grains an hour. The solution takes place at the alkaline or negative pole. In the same time, and under the same circumstances, phosphatic calculi can be dissolved at the rate of from two to twenty-five grains. The solution takes place at the acid or positive pole. Calculi, consisting of oxalate of lime, proved to be far less soluble, usually not more than half a grain an hour, and at most two grains being dissolved. At the conclusion of the reading of the paper, the author stated, that he had been engaged in making further experiments with a solution of nitrate of potash containing only ten grains to the ounce; and he exhibited some large uric acid and phosphatic calculi, which had been partially dissolved by the decomposition of this solution at the surface of the calculi. He also showed a catheter, or litholyte, made by Weiss, which fulfilled the conditions requisite in an instrument for effecting the solution of urinary calculi in the body. It resembled an ordinary lithotrite, but the blades were—1st., isolated so as to conduct the electricity to the surface of the stone when it had been caught; 2ndly, the external surfaces of the blades were guarded, so that in case they came in contact with the mucous membrane, no chemical action would be there set up; 3rdly, a double channel for the injection of the solution of nitre was formed inside the instrument. Lastly, the author stated, that although many difficulties would have doubtless to be overcome before he could lay the result of his experiments within the body before the Society, still they would only be mechanical difficulties. The principle, which consisted in setting up mechanical action at the spot where it was wanted, whilst elsewhere a dilute neutral solution was present, left nothing further to be desired; at least so far as the solution of uric and phosphatic calculi was concerned. At present, by the aid of the lithotrite, mechanical force is applied to the surface of the calculus, and the stone is passed in fragments. At some future time, by the aid of the litholyte, chemical force will be set up at the surface of the calculus, and it will be passed in solution, or as an impalpable precipitate.—*Med. Times and Gazette, January* 1, 1853, *p.* 21.

69.—ON THE CAUSES OF DEATH FROM LITHOTOMY.

By William Coulson, Esq., Surgeon to St. Mary's Hospital.

[The accidents which are of the most formidable nature after this operation are—hemorrhage, infiltration of urine into the cellular tissue with suppuration and abscess of this structure, inflammation of the bladder, peritonitis, purulent infection, and secondary disease of kidneys. Dangerous hemorrhage is stated to be of uncommon occurrence. Mr. Liston stated that he had lost but one patient from bleeding, out of 100 operations.]

Hemorrhage, properly so called, may arise from division of the superficial artery of the perineum, the transverse artery, or the artery of the bulb, and the internal pudic itself. In some cases the accident arises from the surgeon's making his incisions in an irregular manner; but the most frequent cause, I believe, is some irregularity in the origin, course, or relations of the numerous bloodvessels distributed to the perineum.

As I have already observed, the operator may, in making his incisions, err in three ways; he may commence his incision too high, or he may incline it too much laterally towards the tuberosity of the ischium. Each error may bring its peculiar consequences after it.

When the incision is commenced very high up, the point of the knife is apt to fall on the bulbous portion of the urethra, or divide to one side of it the artery of the bulb. The late Mr. Key used to affirm, that the artery of the bulb was generally divided in the lateral operation; but this was undoubtedly an erroneous impression. It takes its origin too high up from the pudic to run any danger, unless some variety in its origin exist. From its deep position, and the readiness with which it retracts within its sheath, the surgeon may experience much difficulty in taking it up.

By prolonging the incision too far downwards, that is to say, carrying it much beyond the level of the tuber ischii, the superficial branches which the internal pudic sends to the margin of the anus are almost sure to be divided; but here again the superficial situation of the vessels, which are not usually large, enables the operator to secure them without difficulty.

The trunk of the pudic artery itself may be divided when the incision is lateralized too much, and its lower angle made to terminate very close to the ramus of the ischium. This accident has happened in the hands of the very best surgeons; yet I cannot help thinking with M. Blandin, and many other anatomists, that it is impossible for it to occur, unless there be some irregularity which disturbs the normal relation of parts at the floor of the pelvis. The trunk of the internal pudic artery is closely bound down to the ramus of the ischium by a layer of dense fascia, and is nearly an inch and a half from the margin of the anus; nor does it begin to detach itself from the bone until near its terminal division. Under ordinary circumstances, then, I am of opinion that the trunk of the internal pudic cannot be wounded during the lateral operation.

The accident, however, has occurred, and to the masters of our art. Deschamps relates how Desault cut the internal pudic with Hawkins'

gorget. The same misadventure has happened to M. Roux, to Dr. Physick, in America, to Sir Charles Bell, Sir E. Home, and others, in this country, and twice to Klein in Germany. Finally, the superficial artery of the perineum may be implicated, because, in some subjects, it is near to the median line; but the artery can be taken up without difficulty in this situation.

Having thus pointed out the various sources of primary hemorrhage which depend on errors in the mode of making our incisions, I must explain to you the more frequent ones connected with the abnormal origin or course of the arteries of the perineum. This cause of primary hemorrhage was alluded to in a general manner by Deschamps; but it is only since the works of Barclay and Harrison, Meckel, Tiedeman, and Quain, appeared, that we have been able to follow it up in a clear and satisfactory manner. The trunk of the internal pudic artery, as I have told you, is closely bound down by fascia against the ascending ramus of the ischium, and thus lies more than half an inch out of the way of the knife in the lateral operation. In some cases, the trunk of the vessel is not so closely applied on the bone, but begins to ascend towards the median line almost as soon as it leaves the level of the tuberosity, Here the danger of dividing it is great in proportion to the lateral direction of the incision on the one hand, and the median inclination of the artery on the other.

Mr. Coote, of Bartholomew's Hospital, has recorded a very remarkable example of this deviation; as soon as the internal pudic had re-entered the pelvis, it passed over to the rectum, and ascended along it towards the triangular ligament, where it divided into its three terminal branches, one to the bulb, the other to the corpus cavernosum, and the third to the dorsum of the penis. Mr. Coote remarks, that the pudic artery would have been unavoidably divided in this case, had lithotomy been performed.

The inferior hemorrhoidal artery is usually detached from the trunk of the internal pudic about the level of the posterior margin of the anus, but it often arises much higher up, sometimes close to the edge of the transverse muscle, and there crosses the perineum obliquely downwards and inwards. In such case its division must be inevitable, and the surgeon should be prepared for the accident, lest the unexpected occurrence of hemorrhage at an early stage disconcert him.

The transverse artery of the perineum is occasionally double, and if the two branches were divided, the bleeding would of course be more copious than if a single vessel only existed.

The artery of the bulb is subject to numerous varieties of much importance in connexion with lithotomy. This artery sometimes arises much lower down than usual, and crosses the perineum obliquely upwards in the way of the lateral incision. A good specimen of this variety is preserved in the Museum of St. Bartholomew's Hospital.

In some cases, the artery is either very small, or altogether absent; in others, it arises from the obturator artery. The course of the vessel is also liable to variety, for it has been found passing backwards towards the rectum, or running immediately above the lower margin of the triangular ligament to join the bulb. Sometimes the artery of the bulb

of one side furnishes that of the opposite, and then it is very large; in such a case, if the single trunk happened to be on the left side, its division would inevitably be attended with great hemorrhage.

The pudic artery is said to be sometimes wanting, and its place supplied by a vessel which Mr. Quain has denominated the accessory pudic; but it would be more correct to say that in some cases the internal pudic never leaves the cavity of the pelvis, but descends along the postero-inferior surface of the bladder to the prostate, which it either penetrates or winds round, to be distributed to the penis.

Here the artery is very much exposed during division of the prostate; and the same accident may be the consequence of varieties in the course of the dorsal artery of the penis. These latter are much more frequent than is commonly supposed. Indeed, the dorsal artery so often arises from the obturator or some other branch of the hypogastric, and passes forwards under the symphysis pubis to the dorsum penis, that the older anatomists, and even Winslow, mistook this for the regular distribution. In many other cases, however, the dorsal artery, instead of coming out with the vein under the symphysis pubis, gains the side of the prostate, round which it winds to the dorsum penis. The late Mr. Shaw, of the Middlesex Hospital, lost a patient from division of this anomalous branch while incising the prostate; and Professor Harrison, of Dublin, justly remarks that it may account for many other cases of fatal bleeding during this stage of the operation.

We are totally unacquainted with the causes which produce these curious varieties in the arterial system, but I may remark that the dorsal artery of the penis, when anomalous in origin has a strange tendency to attach itself to the obturator artery. Dr. Hume has recorded a case where the obturator arose from the epigastric, and gave off the dorsal artery in such a way, that whether the patient had been operated on for hernia or for stone, he must have been exposed to hemorrhage. In one other remarkable case, where the obturator arose from the femoral just below Poupart's ligament, it furnished the dorsal artery of the penis. The preparation is, I believe, in the Museum of the University of Cambridge.

In a few rare cases, the dorsal artery of the penis has been found taking its origin as a distinct vessel from the external iliac, or from some branch of the hypogastric artery. The vessel may in such cases cross the surface of the prostate to gain the crus penis, and thus be exposed to injury.

From what I have now said, you may perceive that primary hemorrhage may occur during the external or internal incisions. In the latter case, the danger is proportionate to the extent of the incision through the prostate: in the former case, to the amount of its deviation from the median line.

Venous hemorrhage is another accident of lithotomy which occasionally occurs, although its possibility is denied by several authors. It is sometimes supposed to arise from division of some portion of the bulb, an accident not easily avoided when we have to operate on old patients. The bleeding from this source, however, is easily commanded and seldom profuse. A more serious form occurs from division of the venous plexus

about the neck of the bladder and prostate. In aged patients, and after long-continued irritation of the urinary organs, these veins are apt to become abnormally developed, even to a varicose state. Besides this, they are enveloped in prolongations of the deep pelvic fascia, and thus prevented from retracting or becoming quickly closed after division. From these causes, troublesome venous hemorrhage may come on in old patients submitted to the operation. Sir B. Brodie lost a patient within a few hours from this cause, having been foiled in all his efforts to restrain the bleeding. It may take place in adults, or even in children, under peculiar circumstances. M. Robert witnessed two examples at the Hôtel Dieu of Paris. In one case, that of a young man, the venous plexus continued to pour forth blood until death ensued. No artery had been wounded. The second case was that of a child addicted to masturbation. The enlarged veins furnished a copious bleeding, which became suddenly fatal after an act of that vice. These are altogether exceptional cases, for we may lay it down as a rule that the danger of venous hemorrhage is in direct proportion to the age of the patient.

The period at which secondary hemorrhage sets in is very uncertain. It may be in some sort a continuation of the primary hemorrhage, that is to say, some of the divided vessels may continue to pour out blood in small quantities. In other cases, it arises from some of the smaller arteries, which did not bleed when first divided. Hence, you should make it an invariable rule to examine the patient's linen every day for any traces of blood, more especially if the pulse become feeble and the face pale. Secondary hemorrhage, however, usually commences about the fifth or sixth day—sometimes earlier, on the third or fourth—sometimes later, on the eighth or tenth day.

[Infiltration of urine into the cellular tissue is one of the most frequent causes of death. To understand completely the manner in which this may take place, we should bear in mind the arrangement of the different pelvic fasciæ.]

Infiltration of urine may take place under two different circumstances. It may occur whenever the internal incision is carried beyond the limits of the prostate, or when the neck of the bladder and prostate are injured and lacerated during the efforts made to extract a large calculus. In both these cases, the fibrous capsule of the prostate is divided or lacerated; the urine becomes infiltrated into the subjacent cellular tissue, inflammation sets in, and, according to its seat or extent, excites peritonitis or gives rise to sloughing and gangrene of the soft parts within the pelvis.

Infiltration, again, may occur, not from a too free internal incision, but because the external one has not been made on the same plane as the internal; because it has been too small, or the soft parts which constitute its walls have been lacerated and rendered irregular during the extraction of the stone; anything, in a word, which impedes the free discharge of urine through the external wound, may become an occasional cause of this infiltration, which takes place in the perineum, and not in the sub-peritoneal cellular tissue as in the former species. Simple inflammation of the pelvic cellular tissue, not caused by urinous infiltration, is, I believe, a very rare accident.

The distinction which I have just drawn between infiltration of urine into the cellular tissue near the neck of the bladder, and infiltration into the cellular tissue about the rectum, &c., may, in some measure, explain the difference of symptoms observed in different cases, and the greater rapidity with which some hasten to their fatal termination. You can readily understand, that when such an irritating fluid as the urine comes in contact with the cellular tissue close to, or immediately underneath the peritoneum, the latter membrane may be rapidly involved in the inflammation, and death speedily follow. On the other hand, the effects of infiltration into the more superficial parts of the wound are usually slower, but it gradually extends over a larger surface, causing sloughing, abscesses, gangrene, and the worst kinds of inflammation, which is almost as destructive as that involving the peritoneum.

The symptoms of urinary infiltration are extremely various, for the effects of the accident are modified by several circumstances. In some cases, the symptoms set in a few hours after the operation, and terminate fatally in a few hours more, or within a day or two; in other cases, the progress of the disease is slower, and the patient does not sink until after a considerable period.

The sub-peritoneal is, as might naturally be expected, the most rapid and dangerous. The patient complains of pain about the neck of the bladder, and from the very outset has a peculiarly unfavourable and anxious expression of countenance; the pulse is small, weak, and rapid; the tongue soon gets dry; and the lower part of the abdomen tumid and painful; often there is vomiting; prostration now rapidly ensues; there is low delirium, and the patient dies within forty-eight hours.

In other cases the typhoid symptoms and prostration are not so great; the fever at first is of a more irritative character, and is occasionally interrupted by rigors; still, as the urine continues to work its way between the layers of the fascia, and the inflammation ascends along the sides of the rectum, more unfavourable symptoms do not fail to present themselves: the skin becomes hot, the tongue very brown, the intellectual faculties confused, diarrhœa and vomiting supervene, and the patient either sinks in a state of prostration, or is cut off by the addition of peritonitis to his other maladies.

[Purulent infection is not often a cause of death in English surgery. Inflammation of the bladder is somewhat common; but we should estimate the inflammation caused by the stone, and that also of the operation. In alluding to the last cause of death after lithotomy, Mr. Gay, in his concluding remarks, says, that calculus vesicæ can never long exist without producing deterioration of the system and latent disease of the kidneys, and with such cases as these, he observes, lithotritists are very careful not to meddle.]—*Lancet, Dec.* 4, 1852, *p.* 507.

70.—*Mr. Hutchinson's Air-Compressor of the Testicle.*—[The ordinary mode of maintaining pressure of the testicles by means of strips of plaster has its disadvantages. If it is awkwardly applied it causes great

pain, and the necessity of the frequent re-application makes it troublesome and annoying.]

To obviate these objections, an apparatus has been contrived by Mr. Hutchinson, which consists of a double bag (on the principle of the double nightcap) with the cavity of which a tube communicates. The whole is constructed of air-tight material, and to the end of the tube, which is long and flexible, a small screw-cock is affixed. The enlarged testicle having been put into the involuted bag, the latter is kept in place by means of a riband tightly tied round the cord. Air is then blown through the tube into the cavity of the bag, and compression of the enclosed gland is effected, just as would be the case with the lung if air were forced into the pleural sac. When filled as full as the patient can comfortably bear, the screw-cock is closed, and the air retained. As soon as by diminution in the size of the testicle the tension has become much lessened, a little more air may, without any necessity for changing the apparatus, be blown in, and thus a condition of constant and equable compression is sustained. With regard to putting on the bag, no more difficulty is found in insulating the affected organ than is the case in applying strapping. The support afforded is very comfortable, and the inflamed part being protected on all sides from friction, blows, &c., by a cushion of air, the patient can walk about, or follow his usual avocations. It must, however, be admitted, that the bulk is considerably greater than that of a merely strapped gland. Its chief disadvantages, as far as it has yet been tried, appear to be, that, from being made of non-permeable material, it entirely confines the cutaneous exhalations of the part, and also that the skin beneath the constricted neck is little liable to excoriate. For the sake of cleanliness, therefore, the bag should be removed, and the skin washed once a day; if necessary, the latter may be smeared with oil, or protected by a layer of oiled silk. If the case be suitable, a piece of lint, smeared with mercurial ointment, may be wrapped round the testicle, and the bag applied over it. The cases in which Mr. Hutchinson has proposed to use his invention are chronic and subacute inflammation of the gland, varicocele, some peculiar forms of hydrocele, after paracentesis, and possibly malignant affections.—*Med. Times and Gazette, Feb.* 26, 1853, *p.* 218.

71.—VARICOCELE TREATED BY THE NEEDLES AND TWISTED SUTURES.

(Under the care of Messrs. Coulson, Fergusson, and Partridge.)

[In considering whether the palliative or curative treatment should be pursued in cases of varicocele, the surgeon must consider the station, life, and occupation of the patient, and the temperament and state of health. If his occupation does not require him to make violent exertion, the palliative treatment must be adopted; and no attempt at curative treatment must be made if the health is not perfectly sound, as even in the most favourable cases fatal results have followed operations upon the veins.]

When the veins of the spermatic cord are in a varicose state, the choice between the palliative or curative treatment is likewise of great importance to the patient; and there can be no doubt but that in the slighter cases a suspensory bandage is preferable to an operation. In fact, the latter period should not be thought of, except there be constant pain, (unrelieved by artificial support,) much inconvenience respecting trade or occupation, or impending mischief to the testicle. When the curative treatment seems advisable, it remains for the surgeon to choose among the various modes of operating which have been proposed and extolled by their authors. First, there is the actual cautery applied by a heated wire; then the caustic, as lately applied in an ingenious manner by M. Bonnet, of Lyons. The operation, as described in the Foreign Department of 'The Lancet,' vol. ii. 1852, p. 244, is performed as follows:—

"The operator, when the patient is insensible with chloroform, seizes the cord with the four fingers of each hand, and tries to find the vas deferens; as soon as he feels that duct, he allows it to glide back from the veins, and keeps the latter fixed by his fingers. One hand is then made to rest on the inguinal ring, and the other on the testicle, and an assistant is then desired to apply a peculiar kind of forceps on the veins which lie between the operator's hands. This forceps is supplied with two little rods, which produce the same compression as the hands when the latter are taken off, and likewise keep the vas deferens at the back of the veins. When the forceps is properly fixed, a transverse incision is to be made across the veins, about an inch and a half in length, and the soft parts are divided until the veins come into view; the operator taking care not to wound the latter. It is important that all the bleeding vessels, even the smallest, should be immediately tied: three or four ligatures are generally necessary. The whole wound is then covered with paste of chloride of zinc, which is allowed to stay for twenty-four hours. The paste is taken off on the next day, and the layer of cauterized parts is removed with the bistoury, their thickness being generally about the one-third of an inch; and the forceps are then also to be loosened, so that the pressure be not exercised too long. A fresh layer of chloride of zinc paste is put on the spot whence the eschar has been removed, and is again allowed to remain for twenty-four hours. At the expiration of this time the forceps is removed, and this concludes the operation. Eight or nine days afterwards, a white eschar, about an inch square, falls off, and this is found to contain the whole of the veins. The latter may easily be known by the dark blood filling the tortuous convolutions. The pain is very severe for the first two or three days, and there is indeed much suffering until the eschar finally falls off. The scrotum and testicles generally become œdematous and inflamed, but the excitement ceases immediately the cauterized parts are detached. The fever and œdema are mostly trifling; no venesection or any other antiphlogistic means are ever required; as soon as the eschar falls off, the patient is as well as if he had not undergone any operation. He generally may leave his bed a fortnight after the cauterization, and the whole treatment does not last more than one month."

The veins may also be obliterated by being gradually rolled upon a

silver wire, the two ends of which, by being twisted, at last accomplish the obliteration of the vessels. This method has been proposed by M. Vidal, of Paris. M. Ancelon, of Dieuze, France, finds fault both with M. Bonnet's cauterization and M. Vidal's rolling of veins. He prefers, and we think with justice, making an incision over the veins without wounding them, and then (without any danger of being mistaken) separating them from the vas deferens and artery. He also deprecates M. Bonnet's repeated applications of the chloride of zinc paste, and advises, when the veins have been laid bare, to keep away the vas deferens and artery by interposing a piece of card folded in the shape of a groove, and then applying caustic paste of the thickness of two lines, which should be left for ten minutes and then taken off. Pain, time, and risk of doing harm to the surrounding textures are thus saved. He operated thus upon a young man of twenty-two years, and in about twelve days the wound was healed, and the patient doing well.

Various other modes of operating have from time to time been used, as Mr. Wormald's ring, M. Ricord's twisting by means of a cord and metal bow, &c.; and, lastly, the transfixion of the veins by needles, and the twisted suture applied over them, as usually done for ordinary varicose veins of the leg. This method seems to have gained ground with us, for several hospital-surgeons have lately adopted it; and we shall now devote a few lines to the cases which have come under our cognizance. Among these we find one lately under the care of Mr. Coulson, the details of which run as follow:—

Samuel M——, aged thirty-five years, was admitted Jan. 14, 1853, under the care of Mr. Coulson. The patient's health had generally been good, but for the last fifteen years he had noticed an enlargement of the veins of the cord. He had also suffered from stricture, for which ailment he had been successfully treated by Mr. Coulson in this hospital one year before the present admission.

On examination, a considerable enlargement of the veins of the cord on the left side was observed; the vessels were partially surrounding the testicle, and this organ was painful to the touch, and appeared rather smaller than its fellow. Mr. Coulson, considering this a fit case for operation, proceeded, on the 15th of January, to tie the veins of the cord.

After having carefully separated the varicose vessels from the vas deferens and the artery, he passed three hare-lip needles under the congeries of vessels, at a distance of about half an inch from each other, and the intervening portions were then strangulated by the twisted ligature. The operation was performed without chloroform, and the patient did not complain of much pain.

No constitutional symptoms followed, but some inflammation of the epididymis came on, which symptom was relieved by poulticing and fomentations. The ligatures came away on the twentieth day after the operation, the wound rapidly healed, and the patient was discharged a few days afterwards in good condition.

[Charles B., suffering from varicocele of six years' duration, was admitted into King's College Hospital, under Mr. Fergusson. Various

palliative measures had been resorted to—as suspensory bandages, and the removal of a portion of the scrotum; but the disease returned on his returning to business.]

Mr. Fergusson performed the usual operation for varicocele, by passing needles under the veins, and then twisting some silk over them just as is done for hare-lip. The operation succeeded, and the patient went out much relieved.

He, however, returned November 27, 1851, as the veins had enlarged again; and four days afterwards Mr. Fergusson used the needles and twisted suture a second time. The patient now complained of some pain up the cord, and slept badly; fomentations gave relief, and on the second day he was much better. On the tenth day there was little pain and discharge, and the dragging sensation was gone. On the twentieth day after the the operation the ligatures came away, and the veins were very much diminished; there was for a little time some dragging sensation about the testicle, but the patient was discharged much relieved about one month after admission.

[James Q——, aged twenty-two, admitted under Mr. Partridge for varicocele of the left side of the scrotum. The disease had existed 3 years.]

On the day of admission, Mr. Partridge operated for the obliteration of the veins, by pinching up a piece of skin containing the diseased vessels, and passing two needles behind them; he then twisted a figure of eight suture around each needle, sufficiently tight to stop the circulation. The ends of the needles were cut off, and a piece of lint wrapped around each to protect the scrotum from injury. The patient was ordered to keep his bed, and the scrotum to be supported by a pillow.

On the third day after the operation, a slight effusion had taken place into the scrotum; to this cold water was applied.

On the sixth day, ulceration began to show itself, the needles were removed, and the sutures left; the effusion had considerably diminished.

On the eleventh day, the twisted sutures came off spontaneously by the effect of the ulcerating process; and, on the twenty-first day after the operation, the wound was quite healed, the patient was ordered to wear a suspensory bandage, and was discharged.

It is curious to observe, that both in Mr. Coulson's and Mr. Fergusson's cases, the ligature came away exactly on the twentieth day. Nor should it be passed unnoticed, that the three foregoing cases afford a good illustration of the well-known fact, that the left side is more prone to suffer from varicocele than the right.—*Lancet, March* 12, 1853, *p.* 246.

DISEASES OF THE SKIN.

72.—ON A NEW CAUSTIC IN MALIGNANT ULCERATIONS OF THE FACE.

M. E. Cazenave, of Pau, relates, in 'L'Union Médicale' for 22nd Jan., two cases of malignant ulceration of the face, in which he has successfully employed a local application, made from sulphuric acid and powdered saffron. The remedy is formed by pouring the acid on the saffron, and

applying it in the form of a soft paste. Its corrosive action is immediately manifested on the diseased tissues; the paste dries, and falls off in two or three days, in the form of black crusts, which carry with them the eschar. The application is made several times: the wound assumes a healthy red tint, and cicatrization takes place. In one case, a year has elapsed, in the other, two years; and the disease has not returned.

The efficacy of this treatment is evidently dependent on the sulphuric acid; which, we believe, would succeed equally as well if made into a paste with common flour, or any ligneous powder, as with saffron. A paste of sulphuric acid and flour would be worth trying in obstinate cases of phagedenic ulceration.—*Association Med. Journal, Jan.* 28, 1853, *p.* 91.

73.—*Collodion and Castor-Oil in Erysipelas.*—M. Guernsant has employed with advantage, in a severe case of erysipelas, an application to the skin, consisting of collodion combined with castor-oil. The formula was—collodion, 30 parts; castor-oil, 2 parts, mix. This varnish was applied once on each three successive days to the parts attacked,—and with good effect, as it caused cessation of the burning pain and the disappearance of the redness. The idea of mixing collodion with castor-oil is due to M. Robert Latour.—*Journal de Méd.; Med. Times and Gazette, Nov.* 27, 1852, *p.* 549.

74.—ON THE EXTERNAL APPLICATION OF THE TINCTURE OF IODINE IN ERYSIPELAS.

By Hugh Norris, Esq., late President of the Royal Medical Society of Edinburgh, &c.

[Mr. Norris, during the last four years, has had extensive experience in the treatment of erysipelas by the tincture of iodine, and he says that]

The results have led me to form the following conclusions:—

1. That the local application of the tincture of iodine over the whole affected part appears to exercise a specific control over erysipelas.

2. That (as might *á priori* have been expected) the earlier the remedy is applied, the more rapidly are its good effects manifested.

3. That it should be repeated as often as the surface becomes pale from the vaporization of idoine, notwithstanding the somewhat severe smarting which ofttimes immediately ensues.

4. That it never acts, as nitrate of silver sometimes does, in at once preventing the spread of the disease beyond the limits of its application, (by circumvention as it were,) but that, locally, it merely produces a rapid absorption of the exudation in the subjacent areolar tissue.

5. That it appears, *cæteris paribus,* to be equally beneficial in the sthenic and asthenic forms of the complaint.

6. That its effects apparently are not merely local; for, in every severe case in which I have used it, it has exhibited a marked control over the constitutional symptoms, the constitutional amendment generally appearing to coincide with the local improvement,—although, in several instances, while the external inflammation was spreading, (the force of the disease, so to speak, having been broken,) the internal improvement has sensibly manifested itself, the pulse becoming softer and less frequent, the tongue cleaner and moister, and the previous distress invariably more tolerable.

In this manner, I have every reason to believe the disease may be frequently cut short in its course.

Of the history of this remedy I know less than of its value. I learned its usefulness from my friend Mr. W. Walter, of Stoke, near Yeovil, a former pupil of Mr. Morgan, Surgeon to the Bristol Royal Infirmary.

The latter gentleman kindly informs me that his notice was first directed to it by a pamphlet published some years since by Dr. Davies, of Hertford, 'On the Use of Iodine Locally Applied.' Since that time "experience the most ample and most satisfactory," in both public and private, has confirmed his good opinion of this remedy for erysipelas, more especially in that form which attacks the head and face, whether traumatic or idiopathic.—*Med. Times and Gazette, Dec.* 11, 1852, *p.* 590.

75.—ON THE TREATMENT OF ERYSIPELAS BY IRON.

By Dr. George W. Balfour, Cramond.

[Dr. Balfour was first induced to try the iron treatment in erysipelas, from Dr. Charles Bell's assurance of its great and unfailing success. Since that time he has treated upwards of 20 cases in the same way, and has had no reason to regret doing so. He believes it to be a certain and unfailing remedy for all the varieties of erysipelas.]

The first case so treated was a highly scrofulous woman, with erysipelas of the scalp, arising from irritation of two large sores on it. She was cured in three days. The second was a man with erysipelas of the foot and ankle, cured in two days. The third was a case of traumatic erysipelas of the scalp in a woman; she was ill for a day or two before being seen, but was cured in about five days' treatment. The wound, a deep cut about three inches long, was healed within a week. In short, all the cases, many of them very severe, and accompanied with high delirium, some of them phlegmonous, others vesicular, and several occurring in children, were cured in less than a week on the average. Suppuration took place in none but two, in both of whom the treatment was not commenced till after effusion had taken place. Their convalescence was, of course, more tedious. The ninth day was that on which convalescence commenced even in the most severe cases, and *probably* the course of the disease would have been shorter even in them had the medicine been given more regularly; for so sure is it in its effects, that I can, with I may almost say absolute certainty, predict the state of the patient on

ascertaining the quantity of the drug taken, and a glance at the bottle, is fully as informing as to the state of the disease, as a look at the affected parts themselves.

The tincture of the muriate, is that preparation of iron I have hitherto employed, the dose varying with the age of the patient; the great object being to saturate the system with iron as speedily as possible, and to keep it so till the disease is abated. A few doses suffice to remove the pain, and lessen the heart's action; it acts also as a diuretic, and to some extent corrects the secretions, often cleaning the tongue as well as any purgative. It never produced headache nor other unpleasant symptom, and was continued with advantage throughout the highest delirium. The only other remedy employed was an occasional purgative, and the local application sometimes of a warm poultice, and at others of simple flour or starch powder and cotton wadding, the poultice being preferred, perhaps without much reason, when the situation or extent of the part affected did not throw difficulties in the way of its application.

Its principal curative action seems, as Mr. G. Hamilton Bell supposes, to be exerted on the capillary vessels; and for this reason, that while its diuretic action is equally well maintained by smaller doses, less frequently repeated, its curative action is not obtained unless the system be saturated with it, and kept so for some time. Further, without denying that it may act as a renal purgative in disease, I may add that, from some experiments on myself, it does not seem to do so in health. The quantity of the urine, was much increased by fully a half, yet the quantity of urea was increased relatively and absolutely only to so small an amount, (a grain or two in twenty-four hours), as to be far within the usual limits of aberration, and much too insignificant, supposing it to be real, to account for the wonderful curative agency of the drug. On taking twenty minims of the tincture every two hours, the second and third doses produced some slight degree of tension in the head, a symptom which subsequently ceased, and did not return. At this period, too, the pulse was slightly accelerated, possibly from nervousness, it afterwards came down from 80, my usual average, to 64. The iron was taken at intervals for four days, regularly every two hours for the last twelve hours. Its diuretic action was always established within an hour after taking each dose: no iron could be detected in the urine, nor in the serum of the blood; but as this may depend on my want of refinement in chemistry, I am willing to give any chemist who may be anxious another opportunity by repeating the experiment; for I know no method of treating any disease more worthy of investigation, and none more deserving of adoption by the profession than the treatment of erysipelas with iron. Some have supposed its efficacy to be owing to its *stimulant* action: that this is not the case was well shown in a case I had recently under my care,—a young man labouring under scarlatina, who had a patch of erysipelas vesicular over the sacrum, and one over the right armpit. Neither of these were at all influenced by the carbonate of ammonia, employed in the treatment of the co-existing scarlatina, but yielded at once to twenty-four hours' treatment with the muriate of iron. —*Monthly Journal of Med. Science, May*, 1853, *p.* 428.

76.—TREATMENT OF ULCERS OF THE LEG.

[The facilitation of the flow of blood towards the heart is the great object to be attained in treating ulcers of the leg. Many methods have been proposed whereby to affect this. That employed in the Middlesex hospital, is the most easy and rational; the limb being raised high above the level of the body on an inclined plane. By such a plan ulcers commonly heal rapidly.]

In a very large majority of cases of ulcer of the leg, however, such treatment is inapplicable, on account of the patients being obliged to continue up and about their ordinary avocations. Means, therefore, by which the end may be accomplished without restriction to bed are the most important, because most generally available. Among the out-patients at the London Hospital the plan of strapping the whole leg from the toes to the knee with inch-wide strips of plaister, and then applying over them a bandage as tight as can conveniently be borne, is carried out on a large scale, and with very great success. The additional expense and trouble involved in this plan appear to be much more than counterbalanced by the comparative speediness of the cure. Its certainty is so great, that Mr. Critchett informs us, that he is commonly able to state beforehand the time which any given sore will require to heal, and that failures almost never occur.*

Of the common plan of bandaging the leg we need say nothing here, as it is in almost universal employment. We must not, however, omit allusion to some methods frequently adopted in cases in which the superficial veins are much diseased, and which are especially intended to afford support to those vessels. Many of our readers will be familiar with the fact, that those who suffer from this disease, despite the alleged evil influence of local constriction, derive great benefit from regularly wearing strong elastic garters. At St. Bartholomew's, Mr. Wormald is accustomed to direct the application of a folded compress of lint over the trunk of the internal saphena, immediately below the knee, to be fixed with considerable tightness by means of a broad strip of sticking plaster. An artificial valve is thus constructed, and the superincumbent column of blood supported. The same object is gained yet more effectually by Mr. Startin's elastic spiral bandage, in frequent use at the Hospital for Diseases of the Skin. This bandage consists of a strip of vulcanised India rubber, half an inch broad and three yards long, terminating at one end in a large loop, and at the other by strings of tape. The loop is passed over the instep of the foot, and the bandage is then carried spirally round and round the leg as far as the knee, where it is fixed by means of the strings. The space allowed to intervene between the convolutions is usually from an inch to two inches, and the degree of tightness with which the bandage is applied varies, of course, according to the case. By its assistance, *elastic* support is afforded to the dilated

* For a valuable practical exposition of the details of this method of treatment, we must refer our readers to Mr. Critchett's work on the subject. It is very important that the plaster used should be of an unirritating character, and that it should be spread on unglazed calico. That employed at the London Hospital is made with the emplastrum plumbi, and appears admirably suited for the purpose.

vein at *many* parts of its course. The facilities which it affords for the dressing of the sore itself constitute one great recommendation, since there is no need to remove the bandage, but merely to stretch two of its coils and place beneath them the lint, etc., which is thus aptly retained in its place. In some cases of peculiarly irritable skin, it is however, more convenient to apply a common calico roller lightly first, and the elastic band over it, or the latter may be put outside the patient's stocking.

The radical cure of varicose veins by obliteration is very commonly practised in some of the hospitals. We observe that Mr. Solly, and also Mr. Skey, usually employ for that purpose the potassa fusa so applied over the dilated trunk as to produce a small eschar. The only inconvenience which we have ever seen to result from it, has been the production of larger sloughs, and more extended inflammation than was wished for. Mr. Lloyd, Mr. Simon, and Mr. Lee, at the hospitals to which they are respectively attached, frequently practice the operation of passing the needle behind the trunk of the vein, and then twisting a ligature tightly over its projecting ends, so as to constrict the vessel, and induce its ultimate obliteration. By this method, the reputed risk of phlebitis, as a consequence of the ligature of veins, is said to be avoided.

However constant the influence which the dependent position of the leg exerts in inducing and keeping up sores on that part, it is yet very important to bear in mind that such ulcerations are essentially inflammatory, and, to an extent varying with different cases, amenable to the treatment of chronic inflammation. In proof of this, we might instance a very favourite plan of medication with some surgeons, by means of small doses of opium, or of opium combined with minute quantities of calomel: many of the ointments, lotions, and other applications in common use, from their discutient properties, afford additional evidence in the same direction. The employment of blisters is also another circumstance in support of the doctrine, and one respecting which we must here say a few words. Blisters may be applied usefully over the ulcerated *surface* of indolent sores, in order to arouse a new action—on the thickened *edges* of indolent sores, to remove the superficial layers, and to increase the vascularity of the indurated structure below; and, lastly, they may be applied at some *distance from the ulcer,* with view to simple derivative action. We remember watching a case, in which, under Mr. Lloyd's direction, a large blister had been applied to the calf of an old woman, to promote the healing of a very irritable and painful ulcer, just above the ankle. The latter cicatrised with wonderful rapidity, and was well almost before that occasioned by the blister. The best mode of vesicating the edges of ulcers, is by the application of a blistering fluid, of which that prepared by Bulleyn is the one which we commonly see used. But by far the most conclusive evidence as to the inflammatory character of these ulcers which we could give, is derived from the results of the practice pursued at the Hospital for Diseases of the Skin, where, in most cases not complicated with extensively diseased veins, its customary to put the patient under a continued course of the iodide of potassium, or biniodide of mercury; and, at the same time, to apply to the diseased surface itself, the following ointment:—

℞. Hydr. bisulphuret., hydrarg. nitrico-oxyd. aa. ℥ss; creosoti ♏xx; adipis recentis ℥xvi. Misce.

We have been quite astonished in watching the ease with which many very extensive and severe ulcers have succumbed to these measures, whilst no further attention was being paid to the support of the part than by directing the patient to apply every morning a common calico roller made moist by immersion in hot water. It must be stated, however, that in very many of the cases at this hospital, the disease is conjoined with eruptions on the leg, as eczema impetigo, or ecthyma, upon which it often appears to depend. In this class of ulcers the above plan of treatment is, as will be seen, equally adapted for the removal both of cause and effect.—*Med. Times and Gazette, April* 16, 1853, *p.* 398.

77.—OBSTINATE ULCER OF THE LEG—NEW MODE OF INDUCING CICATRIZATION.

Under the care of JOHN GAY, Esq., at the Royal Free Hospital.

[When by favourable cicatrization the size of a large ulcer of the leg has been considerably reduced, the sore sometimes remains particularly obstinate. A case of this kind is recorded by Mr. Gay. The ulcer had remained the size of a shilling, and all means to produce cicatrization had failed, during the long period of twenty years. On examination, Mr. Gay found the healthy skin on each side of the cicatrix was in a state of great tension, and to relieve this, he determined to try the effect of an incision through the skin, where the tension existed in the greatest degree.]

On March 10th this was accordingly done. A longitudinal incision, about three inches long, and deep enough to include the fascia, was made on the inner side of the leg, two inches from the border of the cicatrix.

It was noticed, after the lapse of a few days, that, as if to confirm the propriety of the measure, the new wound gaped most at the part exactly opposite to the unhealed sore, and that the latter had already diminished in size.

April 1.—(Three weeks after the performance of the incision.) The original ulcer is now quite closed by a very sound-looking scar, and of the wound made by the knife there remains unhealed only a mere line of very healthy granulations, which will probably be skinned over in the course of a few days. It is remarkable that the healing of the latter has been partly by the formation of new cuticle, and partly by the approximation of its edges. A stage of contraction will soon no doubt ensue in this cicatrix, but as the traction exercised by it in so doing will be transferred to the back of the leg, where the skin is loose, it may fairly be hoped that the scar of the ulcer will escape injury. Mr. Gay observes, that it is only by thus altering the direction of traction, and transferring it to more healthy and movable parts, that any advantage can be expected from measures similar to the above. If the conditions under which the artificial sore is placed were precisely similar to those of the

original one, it would then share with the latter in the improbability of the accomplishment of cicatrization. But they are not. The incision is made at some distance from the diseased surface, and in healthy parts, yet unstretched, and easily permitting considerable yielding.—*Med. Times and Gazette, April* 16, 1853, *p.* 398.

78.—*Unexpected Effects of the Employment of Carbonate of Magnesia in the Case of Warts.* By Dr. Lambert de Hagueneau.—A stout girl, whose hands were covered with warts, consulted Dr. Lambert for gastralgia, and was ordered to take carbonate of magnesia. At the end of two months the gastralgia remained unaltered, but the warts had disappeared. M. Lambert administered the same medicine to a young lady, in the dose of a tea-spoonful night and morning, for a similar affection. After fifteen days of the use of the powdered magnesia, the warts became flattened and smaller; they dried up, split, and fell off in fragments, and at the end of five weeks had disappeared without leaving a trace.—*La Presse Médicale,* Bruxelles, Sept. 26, 1852.—*Med. Times and Gazette. Jan.* 8, 1853, *p.* 45.

79.—*Treatment of Acne and Boils.*—We have classed these diseases together because they appear to depend very frequently on similar states of the constitution, and are also amenable, for the most part, to similar plans of treatment. The great degree of success which we have observed to accrue from that pursued at the Hospital for Diseases of the Skin, makes us desirous of attracting to it the attention of the profession. It consists, essentially, in the combination of ferruginous salts with saline aperients. In the common forms of acne, as acne simplex and punctata, Mr. Startin usually prescribes ferri sulphat. gr. ij., magnes. sulph. ʒi., ter die sumend.; ordering also a small portion of an ointment, containing the ammonio chloride of mercury, gr. x. ad. ℥j., to be applied to each pimple every night. The acne indurata is characterised by much more of inflammatory condensation of tissue, for the removal of which it is usually necessary to excite the absorbents to increased action, and the iodide of iron, in doses of gr. iij., three times daily, appears to be its most efficient remedy. All who have attentively watched the phenomena attendant on the furunculous epidemic which has been so rife of late years, will be aware that its outbreak in individuals has been very frequently preceded by headache, giddiness, lassitude, dyspepsia, and other evidences of a disordered state of the circulating fluids. This granted, and we have at once a scientific basis on which to ground the requisite treatment. By the exhibition of full doses of iron, in combination with saline purgatives, the blood is at once depurated and renovated. The usual prescription at this hospital is mist. ferri acid. ʒiij. ter die, and under its use the improvement in the general health is often no less manifest than the rapid subsidence of the local disease. With greater care in regard to purgation, the same plan may be adopted in cases of small carbuncles.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 24.

80.—BALMS FOR DISEASES OF THE SKIN.

By M. Cazenave.

Baume Chiron ou de Lausanne, employed to promote the Cicatrization of Chapped Nipples and Broken Chilblains.—Take of olive oil, ten ounces; Venice turpentine, two ounces; yellow wax, one ounce; alkanet root, half an ounce; boil together, strain and add of balsam of Peru, two and a half drachms; camphor, nine and a quarter grains; stir constantly until cold.

Balm for Chilblains.—Take of rectified spirit of turpentine, one drachm; sulphuric acid, fifteen grains; olive oil, two and a half drachms: mix. To be rubbed night and morning on unbroken chilblains.

Goulard's Balm (Oil of Saturn).—Take of essential oil of turpentine, any quantity; heat it *secundum artem;* decant, &c. Used for dressing phagedenic ulcers, ecthyma, some chronic eczemas, and rupia.

Plenck's Mercurial Balm.—Take of mercury, one ounce; Venice turpentine, half an ounce; lard, three ounces; calomel, seventeen grains and three quarters; elemi ointment, three ounces: mix. Used for dressing venereal ulcers.—*Dublin Quarterly Journal, Feb.*, 1853, *p.* 256.

SYPHILITIC DISEASES.

81.—CASES OF SYPHILIS.

By John Grant, Esq., 79th Highlanders.

[In the Regimental Hospital of the 79th Highlanders, during the month of December, 1852, there were twelve cases of primary and one of secondary syphilis. In reporting these cases, Mr. Grant makes the following pertinent observations:]

The exhibition of mercury in any form for the treatment of primary syphilis has now been entirely abandoned, superficial sores readily healing under the local application of nitrate of silver, or sulphate of copper, with the ordinary lotions of acetate of lead and sulphate of zinc.

Chancres with an indurated base are treated with the daily application of solid lunar caustic, and where the surface is foul, or indisposed to heal, black wash is sometimes employed.

The practice of administering gray powder or blue-pill for the purpose of expediting the resolution of bubos, and preventing the appearance of secondary symptoms, has been found so unsatisfactory, that for some time past I have ceased to employ any persistent efforts for the discussion of *suppurating* bubos; and as soon as matter has formed, a poultice is applied, and the abscess opened with potassa fusa.

The dispersion of a bubo by the absorption of its contents into the system does not appear, *à priori*, to be a very desirable result, or one unattended with danger; and recent observation has led me to trace a great proportion of cases of secondary syphilis to subjects in whom bubos had been discussed.

It is not to be inferred, that every glandular enlargement in the groin is on its first appearance fomented and poulticed, with a view to promote suppuration; on the contrary, the discutient system is tried at the commencement, and this object is often attained by the application of poultices, and vesicating the surface by nitrate of silver or cantharides; but as soon as matter has formed, the usual means are employed to bring it to the surface, without further attempts to promote resolution.

In taking a view of all the cases of secondary syphilis treated during the year ending 31st December, the antecedents were generally discussed bubos, and that, out of all the admissions with syphilis primitiva in 1852, the only two instances of secondary symptoms occurred in persons who were salivated for the primary affection.

No doubt, the experience afforded by a single regiment is not very extensive; but should the comparative frequency of secondary syphilis, after the opening or dispersing of bubos, appear to be a question of any interest, the aggregate practice of military hospitals affords peculiar facilities for its elucidation.

No mercury has been administered of late for the cure of syphilis consecutiva; and it is proposed to treat cases occurring during the present year with sarsaparilla, iodide of potasium, &c.—*Monthly Journal of Med. Science, Feb.* 1853, *p.* 136.

82.—*On the Employment of Tannin in Gonorrhœa.* By Dr. Lange, Konigsberg, Prussia.—The author used the tannin pure in eight cases, with sulphate of zinc in two cases, as an injection (ʒss. to ℈ij. to ℥ij. water) in ten cases. The injection was used three or four times a day. The disease in the several cases had lasted from one to five weeks, and from four to six and nine months, &c. The ages of the patients varied from seventeen to forty-three years. They were cured in from six to nine days. No pain followed the use of the injection.—*Med. Times and Gazette, April* 2, 1853, *p.* 355.

83.—*On the Treatment of Bubos.*—M. Bonnafont (L'Union Médicale, 1852, No. 155) describes a plan of treating suppurating bubos, by which he says much time is saved, and unsightly scars are avoided. When the bubo is quite ripe, it is pierced in its most tense part, and in the direction of the ileo-pubic axis, by a seton needle, carrying four threads. The two apertures of entrance and exit of the needle must be formed beyond the perimeter of the phlegmasia of the skin. The pus is gently but effectually evacuated by pressure, and then compression is applied by means of pieces of agaric or a dossil, occupying all the space between the apertures without obstructing them. To these scraped lint is applied, and the whole is supported by a spica bandage. In the evening, somewhat forcible compression is again to be applied, so as to empty the abscess; and the pad is to be again applied. This is to be repeated twice daily until complete cure. Care is to be taken not to draw out the

threads unless free discharge is secured, and their ends should be tied together. The medium time a bubo so treated requires for cure is twenty days, although some are cured in ten; and the points made by the seton leave hardly any marks. When the bubo has been opened before the entire gland had suppurated, the case is sometimes more tedious, a clear or sanguinolent fluid continuing to ooze. In such cases, vinous injections, combined with compression, have been found useful.—*Brit. and For. Medico-Chirurgical Review, April* 1853, *p.* 569.

DISEASES OF THE EYE AND EAR.

84.—ON THE USE OF CHLOROFORM IN OPERATIONS ON THE EYE.

By White Cooper, Esq., Ophthalmic Surgeon to St. Mary's Hospital.

[It is one essential that the patient should be recumbent. Mr. Cooper prefers Dr. Snow's apparatus, to administering it on an handkerchief; as in the latter way it is sometimes liable to affect the operator himself. The patient should not partake of food for five or six hours before the operation. He may swallow a few fragments of ice, however, before it is commenced. If the operation takes place in the afternoon the continuance of the effect of the chloroform generally ensures a good night. Mr. Cooper particularly alludes to the operation of extraction. He says:]

With regard to the operation itself, it is important to have the point of the extraction-knife as sharp, and the edge as keen as possible. If there be the least *hanging*, the eye will be pushed before the knife, from the utter passiveness of all the muscles, and unless the operator is prepared for this, there will be great probability of the counter-puncture being made too near the centre of the cornea, whereby the section will be too small.

During extraction, as ordinarily performed, the lid is dropped as soon as the section is completed, and a pause takes place to permit the eye to become quiet. Under chloroform this is unnecessary: there being no spasm, the curette may be used, and the cataract pressed out the moment the section is completed. When the lens has escaped, the eye presents a curious appearance, always supposing enough chloroform has been administered; the muscles being passive, the iris fall back in a concave form, and the cornea having no support, sinks, becoming as wrinkled as a shrivelled apple. The eye having been gently cleansed, and the lids dried with a soft rag, the upper lid should be lifted by the lashes and brought down over the cornea; then two broad strips of adhesive plaster should be crossed over the eye and cheek, a bandage applied, and the patient left quiet for half-an-hour or an hour, after which he can be removed to bed. When all fear of vomiting has subsided, the plaster may be taken off: but it must be thoroughly softened with warm water, and lifted with the utmost caution and gentleness, so that there be no

dragging on the lids. The subsequent proceedings differ in no respect from those practised after the operation, as ordinarily performed.

In these remarks I have especially mentioned extraction, but the general directions are equally applicable to all operations on the eye; and I may add, in conclusion, that when operating on an eye in a state of inflammation, as in the extraction of a foreign body, a shot, a fragment of steel, or copper cap, the value of chloroform cannot be too highly estimated.—*Association Med. Journal, Jan.* 7, 1853, *p.* 7.

85.—*Treatment of Strumous Ophthalmia*—The great benefit often derivable from counter-irritation to the eyelids in this most troublesome disease is, we suspect, not generally known. At St. Bartholomew's Hospital, Mr. WORMALD is in the habit of first moistening the skin of both lids, and then smearing a stick of lunar caustic over the wet surfaces. The cuticle is, as a matter of necessity, blackened, and usually desquamates in the course of a few days, without the production of any pain. The application should be repeated every week or fortnight, according to the delicacy of the patient's skin. Its use commonly affords a surprising degree of relief to the distressing intolerance of light which mostly accompanies the affection. At the Royal Ophthalmic Hospital it is the practice to paint the tincture of iodine over the lids every three or five days, for the same purpose. Its *modus operandi* is no doubt similar, and, of the two, it appears to be the milder and more manageable remedy. We may add, that Mr. Wormald frequently employs his plan in the treatment of granular lids, and with good results. In order to the re-production of the repeatedly destroyed cuticle, a determination of blood to the skin, and away from the conjunctiva is kept up. On this derivative action its use doubtless depends, a process of chronic inflammation on one surface being thus cut short by artificially originating a necessity for increased nutrition on the other.—*Med, Times and Gazette, Jan.* 1, 1853, *p.* 24.

86.—*New Kind of Curette.* By HAYNES WALTON, Esq.—[In no operations more than those of the ophthalmic class does success depend upon the perfection of the instruments employed. At a meeting of the Medical Society, Mr. Walton stated, that in the extraction of cataract, the complete laceration of the capsule of the lens was often imperfectly performed from the difficulty in using the curette. He also said that]

The flaccid state of the eye which succeeded the section of the cornea, rendered the ordinary curette very liable to be entangled in the iris, not only during its introduction, but withdrawal also, from the eye; and, although there had been some modifications in the instrument, consisting in reduced size, yet the imperfection of it still remained. He proceeded to state, that the curette he had the honour to present to the Society overcame the impediment in question. It was one of small size, to which was fitted a guard that was worked by a spring and a trigger. When

the instrument was closed, the extremity was quite blunt, being incapable of getting entangled in the iris. By pressing on the trigger the guard was withdrawn, and the extremity exposed ready for use. He spoke of the very ready manner in which it could be employed, and mentioned having fairly tested it on several occasions in the living body. The instrument was introduced shut, and carried through the pupil to the capsule of the lens, when it was opened, used, then allowed to close by remitting the pressure on the spring, and in that state withdrawn. —*Med. Times and Gazette, Jan.* 22, 1853, *p.* 99.

87.—ON A CAUSE OF DEAFNESS NOT HITHERTO DESCRIBED.

By Professor Syme, Edinburgh.

Diseases of the ear may be divided into the *curable* and the *incurable.* The former are remediable in accordance with the ordinary principles of surgery. The latter belong to the "Aurists." The two following cases pertain to the surgical department, and present examples of a morbid derangement in the auditory organ, which, so far as I know, has not been noticed by any other writer upon this subject, either general or special.

Case 1. W. T., aged 17, was admitted into the Royal Infirmary on the 27th of September 1848, on account of severe pain and deafness of his left ear. On looking into it, I saw at the bottom of the tube a small white body apparently composed of bone, but so extremely sensitive of pressure that a satisfactory examination could not be accomplished until the patient was placed under the influence of chloroform. It was then ascertained that the growth possessed an osseous consistence, and as it did not so fully occupy the cavity as to prevent me from introducing the point of the small polypus forceps, I, by this means, easily effected its extraction. It was similar in size and form to the half of a small split-pea, and had adhered to the side of the cavity by a narrow neck. The patient sustained no inconvenience, and immediately regained his hearing, while the pain which had been so severe for the preceding three months as to render him unable for following his employment, completely ceased.

Case 2. R. H., aged 35, was admitted into the Royal Infirmary on the 5th of April 1853, on account of deafness and uncomfortable sensations connected with his right ear, by which, he said, that for twenty years the ticking of his watch could not be heard. On looking into the tube, I saw an appearance so perfectly similar to that which has just been described, that I at once recognised the same condition. As the excrescence was larger than in the former case it did not allow space for introducing the point of the forceps, but allowed a probe to be passed round it, so as to let me ascertain the position of its connecting pedicle. By means of small straight scissors I divided this and then lifted out the piece of bone.

The patient immediately regained his power of hearing.—*Monthly Journal of Med. Science, May* 1853, *p.* 439.

88.—ARTIFICIAL TYMPANIC MEMBRANES.

By Joseph Toynbee, Esq., F.R.S.

[At a meeting of the Pathological Society,]

Mr. Toynbee said, that certain experiments and dissections, which he performed during the past year, had convinced him that the guttural orifice of the Eustachian tube was closed, except during deglutition, and he was subsequently led to infer, that, for the function of hearing to be perfectly performed, it was requisite that the tympanum should be a closed cavity, being convinced that, if it were not so, the sonorous undulations would not strike the tympanum with sufficient force. He determined, therefore, to close, entirely by artificial means, the next case of perforated tympanum that presented itself, and did so with great success; and, since that, he had employed an artificial membrane with great benefit in between thirty and forty cases. He (Mr. Toynbee) had used thin layers of vulcanised india-rubber or gutta-percha, to construct the artificial membranes; to the centre of one of the surfaces of this membrane he attached a fine wire or stem of some other material, by means of which the septum could be passed down and adjusted. Mr. Toynbee employed this treatment, first in the case of a man aged 43, who had been discharged from the army for deafness. In each membrana tympani was an aperture between one and two lines in diameter, and the mucous membrane of the tympanum was thicker and redder than natural, and discharged freely. Blisters behind the ears and astringent injections were prescribed, and a slight improvement followed. The man's hearing, however, still remained very defective, so that he was unable to follow any useful pursuit. At the commencement of last June, therefore, Mr. Toynbee placed in the left ear a very delicate layer of vulcanised india-rubber. When it was properly adjusted, the patient observed, that he heard more clearly than he had done for years. Ever since that time, this patient had worn the artificial membranes, and, with their aid, he could hear almost as well as any other person; but when they were removed, he could only hear words spoken in a loud voice. The man was then introduced, and the artificial membranes having been removed, the members of the Society had the opportunity of observing the perforate condition of the membrana tympani. After the removal of the membranes, he could not hear unless loudly spoken to, but when he had replaced them, which he did with apparent readiness, his hearing was excellent.

[A conversation ensued afterwards as to the necessity of an aperture existing in the tympanum for the production of sonorous undulations. It was stated both by Mr. Brooke and Mr. Toynbee that it had been established by the experiments of Müller and other inquirers, that such an aperture was necessary only for the formation of loud sounds, such as were produced by the kettle-drum, but that a small instrument like the ear required no such aperture to enable the undulations of air in the tympanum to take effect.]—*Med. Times and Gazette, Feb.* 12, 1853, *p.* 176.

89.—ON THE MUSCLES WHICH OPEN THE EUSTACHIAN TUBE.

By Joseph Toynbee, Esq., F.R.S.

[The general opinion of anatomists upon this subject may be thus recorded:—

That the guttural orifice of the Eustachian tube is always open, and that the air in the tympanum is constantly continuous with that in the cavity of the fauces. An examination of the guttural orifice of the tube in man and other animals has led the author to conclude, that, except during muscular action, this orifice is always closed, and that the tympanum forms a cavity distinct and isolated from the outer air. The muscles which open the Eustachian tube in man are the tensor and levator palati, and it is by their action, during the progress of deglutition, that the tubes are ordinarily opened. That the act of swallowing is the means whereby the Eustachian tubes are opened, is shown by some experiments, of which the following may be cited:—If the mouth and nose be closed during the act of swallowing the saliva, a sensation of fulness or distension arises from the air, which is slightly compressed in the fauces, passing into and distending the tympanic cavities. Upon removing the hand from the nose, it will be observed that this feeling of pressure in the ears does not disappear, but it remains until the act of deglutition is again performed, while the nose is not closed. In this experiment the Eustachian tubes were opened during each act of deglutition; during the first act, while they were open, air was forced into the cavity of the tympanum by the contraction of the muscles of the fauces and pharynx, and the guttural orifices of the tubes remained closed until the second act of swallowing, which opened the tubes, and allowed the air to escape. That the act of deglutition opens the Eustachian tubes was inferred also from the custom usually adopted of swallowing while the descent in a diving-bell is performed; by this act the condensed air is allowed to enter the tympanum, and the sensation of pain and pressure in the ears is removed or entirely avoided. The author gives an account of the Eustachian tube and its muscles in mammalia, birds, and reptiles. In some mammalia the muscles opening the tubes appertain as in man to the palate; in others, this function is performed by the superior constrictor muscles of the pharynx. In birds it is shown that there is a single membranous tube into which the two osseous tubes open; this membranous tube is situated between, and is intimately adherent to, the inner surface of each pterygoid muscle, and by these muscles the tube is opened. The conclusion to which the author arrives respecting the influence of the closed Eustachian tubes, is, that the function of hearing is best carried on while the tympanum is a closed cavity, and that the analogy usually cited as existing between the ordinary musical instrument the drum and the tympanum, to the effect that in each it is requisite for the air within to communicate freely with the outer air, is not correct. On the contrary, the author shows that no displacement of the air is requisite for the propagation of sonorous undulations, and and that, were the Eustachian tubes constantly open, these undulations would extend into the cavity of the fauces, there to be absorbed by the

thick and soft mucous membrane, instead of being confined to the tympanic cavity, the walls of which are so peculiarly well adapted to the production of resonance, in order that they shall be concentrated upon the labyrinth.

In corroboration of the above views, the author states, that in cases of deafness, dependent simply upon an aperture in the membrana tympani, whereby the sonorous undulations are permitted to escape into the external meatus, the power of hearing has been greatly improved by the use of an artificial membrana tympani, made of very thin vulcanised india-rubber or gutta-percha, which is so applied as again to render the tympanum a closed cavity.—*Med. Times and Gazette, Feb.*. 26, 1853, *p.* 229.

90.—ON A SIMPLE METHOD OF ASCERTAINING, WITHOUT THE USE OF THE CATHETER, WHETHER THE EUSTACHIAN TUBES ARE PERVIOUS.

By Joseph Toynbee, Esq., F.R.S.

[The common mode of exploring the Eustachian tube by the catheter produces pain and discomfort, and requires great experience in its use. The plan also of attempting to distend the tympanum by a forcible expiration, while the mouth and nostrils are kept closed, is by no means always successful.]

In a paper recently read before the Royal Society, the author endeavoured to show that the guttural orifice of each Eustachian tube is generally closed, and that the air in the tympanum is not continuous with that in the cavity of the fauces, except during the momentary act of deglutition. In proof of this, the following experiment was cited:—If the mouth be shut, and the nostrils be held closed by the finger and thumb, and then the act of swallowing be performed, a sensation of fulness or pressure is experiencced in each ear; and this sensation does not disappear upon the removal of the pressure from the nose, but it vanishes at once when the act of swallowing is again performed, while the mouth and nostrils are open. During the first act of swallowing, a small quantity of air was forced into the tympanic cavities through the Eustachian tubes, and it therein remained until the second act of swallowing again opened the tubes and permitted the air to escape. The muscles whereby the Eustachian tubes are opened are the tensor and levator palati, which it is well known take origins from the cartilaginous walls of the tubes. As, during the act of swallowing with closed mouth and nostrils, air is forced through the Eustachian tubes into the tympanic cavities, it is evident that the permeability of these tubes can be ascertained by making the patient swallow some saliva while the mouth and nose is shut. Nor need the surgeon depend upon the statement of the patient respecting the sensation of distension felt in the ears; for by listening with the *otoscope*, should the Eustachian tubes be pervious, the air will be distinctly heard to enter the tympanic cavities, and produce a gentle crackling sound. The author next proceeds to consider the treatment of cases of obstruction of the Eustachian tubes, especially in

reference to the use of the catheter. It having been ascertained that these tubes are obstructed, is it desirable to attempt to open them by means of the catheter? Believing that obstruction in the Eustachian tubes generally depends upon a thickened state of the mucous membrane covering the guttural orifice, and that this state is always associated with a thickened condition of the faucial mucous membrane of the tympanum, the author suggests especially to those inexperienced in the use of the catheter, not to attempt to pass this instrument—firstly, because, in such cases, the mucous membrane of the Eustachian tube is often so tumefied that no ordinary degree of pressure will force the air into the tympanum; and, secondly, because, should the surgeon succeed in transmitting a few air-bubbles, the relief obtained is only partial, and endures for a very brief period, since the mucous membrane remains as thick as before, and the ill effects of the obstruction soon recur, from the air in the tympanum becoming of a different density from that without. The membrana tympani becomes more or less fixed. The treatment recommended is such as shall tend to reduce the thickened mucous membrane of the guttural orifices of the Eustachian tubes to a healthy state, so that their muscles may be able to open them. For this purpose, besides the use of general remedies, the solid nitrate of silver, or a strong solution of hydrochloric acid, may be applied to the mucous membrane of the fauces and to the apertures of the tubes, and gentle counter-irritation is to be kept up over the region of the fauces. By these measures, as a general rule, the mucous membrane can be reduced to its natural state, and the tubes become again opened by their muscles. Should this not take place the Eustachian catheter may now and then be introduced and air be gently blown through it. A modification in the shape of the shape of the Eustachian catheter is suggested—viz., that it should be oval instead of round, the advantages derived, being that it not only can be passed through the nose with less discomfort to the patient, but its presence in the Eustachian tube is much less disagreeable from the absence of the convex surfaces which, in the rounded catheter, press against the nearly flat surfaces of the tube. In conclusion, the author expresses his concurrence in the opinion of Harvey and Kramer, that enlarged tonsils are never the cause of obstruction in the Eustachian tubes, and that any benefit that may have followed their extirpation has arisen from the loss of blood consequent upon the operation.—*Lancet, April* 9, 1853, *p.* 348.

MIDWIFERY,

AND THE DISEASES OF WOMEN.

91.—ON THE INDUCTION OF PREMATURE LABOUR, BY THE METHOD OF PROFESSOR KIWISCH, OF WURZBURG.

By Dr. W. Tyler Smith.

[Hitherto the main agents in exciting the gravid uterus to expel its contents have been—the administration of ergot, dilatation of the os uteri by sponge-tents, the separation of the membranes from around the os and cervix uteri, or puncturing the membranes by some convenient instrument. The ergot is uncertain in its operation, and the use of sponge-tents are not only uncertain in their effects, but in some cases the application is difficult if not impossible. The same remarks apply also to the separation of the membranes.]

The operation of puncturing the membranes is far more effective than either of the preceding methods. It almost invariably brings on labour within a few days of its performance. But cases of deformity are met with, and these are the cases requiring most imperatively the induction of premature labour, in which the most experienced practitioners are unable to enter the uterus. In cases requiring the induction of premature labour in the early months, before the development of the cervix uteri, the attempt to puncture the membranes must always be a serious undertaking. Numerous instances are on record in which serious results have occurred from the attempt to evacuate the liquor amnii. Two or three years ago a patient died after the performance of this operation in whom, upon a post-mortem examination, the internal iliac was found to have been punctured. Dr. Radford has related a case, in which the Cæsarian operation was performed successfully, but the woman becoming pregnant again, an operation for inducing premature labour was performed, with a fatal result. The difficulty of reaching the os uteri, in cases of great pelvic deformity, was referred to at the discussion at the Medico-Chirurgical Society last year, as a justification of the Cæsarian operation; and the possible and known dangers of the proceeding were among the grounds of opposition to this great obstetric advance, put forward in the more recent discussions of the French Academy.

But the operation of puncturing the membranes, even when it can be performed readily, has its disadvantages. This is particularly the case when the operation is performed in the eighth or ninth month, with a view to save the child. The evacuation of the liquor amnii is always an unfavourable commencement of labour, particularly in cases of distortion, when turning may have to be performed, and when the child is subject to long-continued pressure before and during delivery. It is to

the withdrawal of the liquor amnii, as one important consideration, that we may refer the considerable mortality to the fœtus which takes place in the induction of premature labour by this operation.

Under these circumstances, a new method of inducing premature labour, devoid of many of the disadvantages and of all the dangers of previous operations, cannot fail of being recognised by obstetricians as a great boon. It is to Dr. Kiwisch Ritter von Rottereau, obstetric professor in Würzburg, one of the highest obstetric names in Germany, that we owe the principle of the operation practised in the following case; and this is not the only improvement which his great practical genius has conferred upon obstetric medicine.

Without further preface, I proceed to detail the following example—the first, I believe, in which the plan of Dr. Kiwisch has been carried into operation in this country, and which was attended by complete success.

[E. H——, aged 37, was as near as could be calculated in her 37th week of gestation. She was the subject of a severe spinal distortion which had latterly much increased. She had borne three living children, but only after the most protracted labours. On examination, the uterus was greatly anteverted, and the urine for a long time had escaped almost involuntarily. The antero-posterior diameter of the brim of the pelvis was certainly under three inches. After carefully weighing these conditions, the induction of premature labour was determined upon, and Dr. Smith proceeds:]

I resolved on trying the plan proposed and adopted by Professor Kiwisch, of Würzburg, which consists in directing a stream of water from a height by means of a syphon, continuously upon the os uteri. Kiwisch recommends the use of warm water; but knowing from experience, in cases of hemorrhage, the increased efficacy of the alternation of hot and cold temperatures in causing uterine contraction, I determined to try the effect of alternating the hot and cold douche. Kiwisch's mode of operating is alluded to in vol. viii. of the 'British and Foreign Medico-Chirurgical Review,' but it had been previously described to me by Dr. Schneemann, of Hanover. I followed his method as nearly as I could under the circumstances, without any time for previous preparation: the only difference being in the variations of the temperature of the douche.

September 1.—Half-past nine, a.m.: A piece of india-rubber tubing, above eleven feet long, and half an inch in diameter, was connected with a straight tube from an injecting apparatus, five or six inches in length, the latter forming the uterine extremity of the syphon. A vessel containing two gallons of water of about 110° Fahr., was placed nine or ten feet from the ground, the patient being placed in an empty hip-bath. The proper end of the tube was now passed into the vagina, and directed towards the os uteri, where it was held steadily. After exhausting the tube, the other extremity was placed in the warm water. The stream immediately began to flow with considerable force against the os uteri, and continued until the whole of the contents of the vessel had been discharged. Two gallons of cold water were then poured into the vessel, and discharged in the same manner. The time occupied by the whole

douche was from twenty minutes to half an hour, the patient only complaining of discomfort when the hot and cold currents first began to run. During the after part of the day she complained of dysuria and occasional pains in her back.

Sept. 2nd.—One p.m.: The douche was again applied in the same manner and quantity. In these applications I had the kind assistance of Mr. Walker, and the subsequent applications were entirely conducted by him; but I give the progress of the case from the notes he was good enough to take at the time.—Nine p.m.: She has had labour pains from half-past twelve till four, so much so that she was nearly sending for Mr. Walker. The douche was repeated at this time. The warm current was discharged as before, but upon the communication of the cold stream, she became hysterical, and had to be removed from the bath.

3rd.—Half-past nine, a.m.: Has had a restless night in consequence of pains "all over" her, but without any particular uterine pain. The dysuria and pain under the pubes are very troublesome. No appetite. The bowels have not acted for two days. Pulse 95. To take six drachms of castor-oil.—Two p.m.: Has had irregular uterine pains since the douche in the morning. I made an examination, and the os uteri could now be felt dilated to the extent of half-a-crown, the fundus uteri being hard and contracted. The bowels have not yet acted. Douche repeated at this time.—Nine p.m.: Had considerable uterine pain for about half an hour after the last visit. Bowels have acted freely, with sickness. Pulse 100. The douche was again repeated, lest the uterine action should remit.

4th.—One a.m.: Mr. Walker was hastily summoned. The patient had suffered powerful expulsive pains, almost without intermission, since the last douche. The head presented in the second position, and about an hour before Mr. Walker's arrival the membranes had ruptured, but only a small quantity of liquor amnii had been discharged. These pains continued with increased vigour, and within half an hour from Mr. Walker's arrival, the child, a girl, was born alive without any assistance. The placenta quickly followed. After the birth of the child, a large quantity of liquor amnii which had been pent up behind the head, was discharged. A draught of ether and camphor was given, and she passed a very comfortable night. She had the usual amount of after-pain, and was hysterical on two or three occasions, but recovered perfectly, and both she and the child are now in good health. A little blood was discharged as usual after the expulsion of the placenta, but the lochial discharge was more scanty than after natural labour. The secretion of milk appeared naturally.

Thus, in this case, delivery was accomplished in sixty-four hours from the first application of the douche. But it must be borne in mind that twenty-seven hours elapsed between the first and second application of the douche, otherwise delivery would probably have taken place earlier. Five applications of the douche were made; but from the state of the os uteri after the fourth application, there can be no doubt that labour would have proceeded, even if the fifth douche had not been employed. Before the first application of the douche, there had not been the slightest appearance of uterine disturbance.

The time between the first application of the douche in this case, and the completion of delivery, was less than frequently occurs in cases of puncture of the membranes. But it has been objected to the douche, by those who have used it on the Continent, that some women are less susceptible of its influence than others, and that the susceptibility of the same woman varies in different pregnancies. I suspect this variation may be obviated by performing the operation, when the time can be selected, at the eighth or ninth catamenial date, and by increasing the energy of the douche by the alteration of temperature.

In a certain class of cases, it becomes necessary to induce labour before the end of the seventh month; when this is the case, the operation simply has reference to the safety of the mother, the ovum being necessarily sacrificed.

In another class, the operation is not called for until after the completion of the seventh month, and in the great majority of these cases the operation is performed with a view to the safety of both the mother and the child, in consequence of the condition of the mother.

In a third class, the operation becomes necessary, in the latter months of pregnancy, to save the life of the child alone, the safety of the mother not being at all involved in the cause of danger to the fœtus, as in diseases of the placenta.

As regards cases requiring the operation before the fifth month, such as excessive and irrepressible vomiting, occurring to such an extent as to threaten death by starvation or debility, the induction of abortion by the douche would evidently be far preferable to either the dilatation of the os uteri, the attempt to puncture the membranes, or the administration of ergot. The latter has little power in such cases, while neither dilatation nor puncture could be effected without danger, because of the undeveloped state of the cervix uteri.

After the fifth month, when in the normal condition of the pelvis the os uteri can be reached, and the membranes punctured with tolerable facility, there is a certain number of cases in which the evacuation of the uterus is called for to relieve the effect of pressure or irritation, and in which the evacuation of the liquor amnii is alone sufficient to relieve the urgent symptoms. In these cases, the operation of puncturing the membranes has the advantage of affording immediate relief. I allude to dropsy of the amnion; excessive vomiting in the latter months of pregnancy; draining hemorrhage from partial separation of the placenta; the occurrence of insanity, convulsions, and chorea; or dangerous oppression of the circulation or respiration. Here the mere diminution of the size of the uterus, which may be obtained by the evacuation of the liquor amnii, without the immediate expulsion of the fœtus, sometimes affords instantaneous relief. In all such cases, puncturing the membranes is a more direct method of obtaining relief than any other procedure, and on this account may be preferred.

In cases where the operation is performed to save the child, without reference to the condition of the mother, as when the child has died, and again at the latter part of pregnancy, from imperfect circulation in the placenta, there can be no question of the superiority of the

douche to any other method. Its operation is, in fact, scarcely if at all different from natural labour, and there is no risk whatever of injury to the mother from its employment.

In fine, from the accounts of the numerical results of the induction of premature labour by the ordinary method, it appears that nearly one half of the children are born dead. This is partly owing to the necessity for its performance in some cases before the fœtus has become viable; and in part to the occurrence of difficult labours from deformity, and from the evacuation of the liquor amnii at the commencement of labour. This latter cause of increased mortality among children born through the induction of premature labour, promises to be entirely obviated by the substitution of the douche for the operation of puncturing the membranes. There are, indeed, sound reasons for preferring the douche in all cases in which the fœtus is living and viable, and in which the immediate relief to be obtained by discharging the liquor amnii is not imperatively demanded. As regards the mother, the douche relieves her from all risk of mechanical injury to the uterus. It is well known that the proportion of mal-presentations is increased in cases in which labour comes on at the full term. In cases requiring turning after the induction of premature labour, the danger to mother and fœtus is increased by the absence of the liquor amnii. But these and other difficulties, which follow upon the evacuation of the liquor amnii before the commencement of labour, when the fœtus has arrived at the latter months, are greatly diminished by the employment of the douche. This happy improvement promises to be of equal value to the mother and child. Above all, it is applicable in cases where the os uteri cannot be reached, where the induction of premature labour by any other known means is impossible, and where the only alternative is the dangers of the Cæsarian section.—*Lancet, Oct.* 2, 1852, *p.* 297.

92.—INDUCTION OF PREMATURE LABOUR BY MEANS OF THE DOUCHE.

By Dr. Shekleton, Master of the Lying-in Hospital, Dublin.

[The following is another case in which the application of the douche, as a means of inducing premature labour, was most successful. The mode of operating was, however, different to that employed in the preceding case. The history is as follows:]

Mary Fells, a woman having an unhealthy appearance, applied at the Dispensary of the Lying-in Hospital, in November last, to get relief, under the following circumstances:—

She stated that she suffered much inconvenience from the enlarged state of her abdomen, consequent upon considerable dropsical effusion into the peritoneal cavity; and that, in addition to the distress arising from the distension of the dropsy, she fancied herself pregnant, her menstruation not having returned since the June prior to her application, and some of the other ordinary symptoms of that state having occurred in due order.

Upon examination it was found that she was perfectly correct in the opinion she entertained as to her being pregnant, for by a little manipulation, through the excessively distended walls of the abdomen, the enlarged uterus could be traced to a certain extent, and auscultation announced the existence of the fœtal heart; as far as could be judged, she was at least five months gone with child.

She stated that the dropsical symptoms had not evinced themselves prior to her present pregnancy, but that, less than a month after the cessation of the last catamenial discharge, she suffered some obscure "dragging pains" in the right hypochondrium, which were followed by a brisk diarrhœa (causing her to seek for aid in one of the hospitals of the city), and that after the urgent symptoms were checked, "she first commenced to enlarge;" having attained her present size in less than four months. She also stated that she was nearly forty years of age, the mother of seven children, four of them alive and healthy; that her own health, up to June last, had always been excellent; and that she had always led a temperate life. She was prescribed for with a view to lessen her present distress, and she was given an admission ticket for her approaching confinement.

On the 8th of the present month (January) she again presented herself, being forced to seek relief in consequence of the increased distress induced by the now enormous distension of the abdomen, impeding considerably her respiration; added to which, she had latterly some hematemesis, and had passed some blood per rectum; her countenance was now collapsed; her belly tense, its walls much attenuated, and her girth round the waist measured four feet two inches. The uterus could not now be traced; neither could we hear any fœtal sounds, but she said that she felt the motions of the child strongly. By vaginal examination the cervix was found not as yet obliterated, and a small fœtal head could be distinguished, presenting above the incompletely expanded neck.

Under existing circumstances it was deemed expedient to induce labour; and thereby to remove so much of the additional bulk as was caused by the gravid uterus, before attempting any operation for the discharge of the effused fluid. This, then, was an admirable case for the douche bath; but it was determined to try it in a simpler form than that which had been previously used,—the apparatus employed being the common elastic bottle-syringe, manufactured by Robertson, of this city, and made use of in the Rotundo Hospital for injecting the vagina, uterus, and rectum with cold water, in cases of postpartal hemorrhage. Accordingly, upon the evening of the 9th, the first douche was applied in the following manner:—She was put upon her left side, in the ordinary obstetric position; a large pan, holding nearly two gallons, was filled with tepid water, and placed upon a stool at a convenient distance from the bed; another (smaller one) held so as to catch the water as it poured from the vagina, after having played against the os uteri. One person now introduced the bone-pipe at the end of the flexible tube, and with the index finger guided the stream against the orifice of the uterus, which was forced onwards by another person, who held the bottle extremity of the apparatus in the large reservoir of water. The process was continued for about five minutes.

On the evening of the 10th, the lips of the os were found soft and flaccid, and the os itself somewhat dilated. In the same manner, and for the same length of time, the second douche was applied.

On the afternoon of the 11th, the os was found about the size of half-a-crown, when the third application of the douche was made; and labour came on almost immediately after (half-past three o'clock, p.m.) and terminated at half-past ten o'clock at night, being of seven hours and a half duration. The first stage was a little tedious. At about ten o'clock the os was fully dilated; the membranes were then ruptured, and a very trivial quantity of liquor amnii evacuated. It was now determined to administer some ergot of rye, but while it was being infused, the uterus with a powerful effort expelled the child, which for a child seven months gone (according to calculation) was exceedingly small and puny. As a precaution, however, against hemorrhage, the ergot was administered, and also some wine. The uterus expelled the placenta by its own efforts in a few minutes; and there was not any attempt at hemorrhage. She expressed herself much relieved after her delivery, and although the decrease in size was not very appreciable, nevertheless, her respiration became much easier. It may be here stated that the child lived only forty-eight hours.

She continued in this slightly improved state until the 13th; but on the evening of this day she suffered dreadfully from dyspnœa, and prayed so hard to be relieved from the pressure of "the water," that tapping the abdomen was performed, and twenty-seven pints of straw-coloured serum drawn off; the removal of this quantity reduced the abdomen to a little less than half its former dimensions; after the operation the dyspnœa was much less, and she expressed herself as gratified at the result; but her improved condition only lasted for a day or two; she then gradually retrograded; on the 20th coma supervened, and she died on Friday the 21st, ten days after delivery.

On post-mortem examination, the abdomen was found to be still largely distended, and on being laid open more than two gallons of fluid were discharged; the intestines were seen to be much distended by flatus; there was increased vascularity of the peritoneum lining the pelvis, and lower part of the abdomen, especially on the left side (where the trochar entered), and there were also a few flakes of lymph floating in the dropsical fluid.

The liver was a well-marked specimen of cirrhosis; the spleen was as large as an ordinary-sized liver, and on section had much the appearance of that organ.

In this short history there are some points of interest, independent of the process of induction. In the first place, there was no dropsy of the amnial sac; indeed, to the almost complete absence of liquor amnii might be attributed the delay in the first stage. Again, the rapidity with which the second stage was concluded,—lasting but a few minutes, although the abdominal muscles were totally excluded from any participation in the expulsive efforts,—is worthy of remark; thus, although the dropsy might have been deemed a complication which would tend to retard to a considerable degree the expulsive stage of the labour,—incapacitating, as it did, the abdominal muscles from taking their share of

the parturient efforts,—nevertheless, by being the cause of the diminutive size of the fœtus, it made up for the power it robbed from the uterus, by indirectly lessening the bulk of the body which that organ had by its own unaided efforts to expel. The weight, also, of the effused fluid might have had some considerable share in keeping the uterus well contracted during the third stage, and preventing (after the expulsion of the placenta) any hemorrhage, thus supplying the place of the hand, which in this instance could not have been applied.

But what is more especially to be noticed in the case is the means whereby labour was induced, and the complete success thereof. The apparatus was much more simple and easy of application than the one used in our former case (viz. Kiwisch's); its effect was magical, the os being opened to about one-sixth of its complete dilatation after the second douche, and labour setting in almost immediately after the third, the patient suffering no inconvenience whatever, not even requiring removal from her couch.

The method adopted in this case is, doubtless, the same as that employed by Professor Simpson, differing only in the species of "hand syringe,"—his being, I believe, an elastic cylinder, with a tube at either extremity, the one vaginal, and the other for conveying the water from the reservoir into the cylinder, in order that the hand may force it into the vagina by contracting its calibre, appropriate valves being placed so as to regulate the ingress and egress of the fluid; while ours was (as described) the common bottle-syringe. I have no experience of the syringe used by Dr. Simpson; but the latter was found to be rather distressing to work with sufficient force for five minutes, and perhaps his would be liable to the same objection; therefore, should another case present itself for induction, I have it in contemplation to employ the stomach pump, in order to obviate manual distress.

In conclusion, if it be true that the manner in which labour is induced by the douche is, as described, merely by the water acting as an external soft wedge, insinuating itself into the os and between the internal surface of the cervix and the membranes, detaching the latter from the former (which explanation I have every reason to consider correct), I do not see why we should not—by imitating more closely the first stages of labour from without, and by repeated douches of moderate duration, and at intervals proportional to the duration of the intervals of that stage—in one day bring on the required labour. Upon this principle I purpose acting, when another opportunity presents itself.—*Dublin Quarterly Journal of Med. Science, May* 1853, *p.* 483.

93.—A CASE OF PELVIC DISTORTION, IN WHICH PREMATURE LABOUR WAS INDUCED BY THE WATER DOUCHE.

By J. Prior Lacy, Esq., Senior Surgeon to the Newark Hospital.

[In this case the patient was aged about 37, and was then in her fourth pregnancy. She had had no previous miscarriages. In the two first labours craniotomy had been performed at the full time. In the third,

premature labour had been induced at seven and a half months. In this last pregnancy the effecting of premature labour had also been decided upon—not in the usual way, but in the somewhat novel one advocated by Dr. Tyler Smith. She was admitted an in-patient on Oct. 29, 1852. A dose of castor oil was first administered, and the operation which took place on the following day is thus described :]

October 30th—half-past nine a.m.—the patient being placed in an open bath, and the uterine end of the india-rubber tube introduced into the vagina, and held opposite to the os uteri, two and a half gallons of water, at 110° Fahr., were poured into the receptacle; as soon as this had escaped through the tube the same quantity of cold water was poured in, and suffered to flow against the os uteri in like manner. The patient complained of some uneasiness when the cold current first began to run.

Three p.m.—The douche was repeated in the same manner as last described, but commencing with cold instead of warm water. Since the first douche, micturition has been rather frequent, but little pain has been experienced

Nine p.m.—The douche was repeated, commencing with warm water; the end of the forefinger can be introduced into the os uteri, but no pain of any consequence has occurred.

31st.—Half-past nine a.m.—The patient has passed a good night, and feels comfortable; the bowels have been again relieved; micturition frequent; slight pain in the back and abdomen; douche repeated, commencing with warm water.—Half-past two p.m.: Some slight shivering, nausea, and giddiness have been experienced since last report; douche repeated, commencing with two and a half gallons of cold, followed by five gallons of warm water.—Half past eight p.m.: The symptoms continue pretty much as at last report; douche repeated in the usual manner and quantity, commencing with warm water. Though no perceptible change in the state of the os uteri has occurred, the patient whilst in the bath experienced increased shivering, nausea, giddiness, and pain in the back. Within an hour after the application of the douche, she had some rather severe rigors, and pains continued to increase in regularity and intensity till half-past eleven p.m. On making an examination at this time, the os was found as large as a crown-piece, the bag of membranes protruding, conical in shape, and very tense, even in the absence of pains.

Nov. 1st.—Half-past one a.m.—The os is fully dilated, and the bag of membranes has almost reached the os externum; the presentation was found to be either hand or foot, but the membranes were too tense to determine which; consequently, as the pains continued regular and severe, it was decided to evacuate the liquor amnii, so that in the event of its being necessary, turning might be immediately performed. On rupturing the membranes, an unusual quantity of water was discharged; one foot was found presenting, and being brought down, was secured by a noose. Pains now ceased almost entirely, and the patient obtained some sleep during the remainder of the night. At eleven a.m., she had an enema of warm water, which was repeated at two p.m.: Some slight pains succeeded. At half-past two p.m., the vagina was injected with warm water. No progress being made, a scruple

of powdered ergot was given at three p.m., and repeated at half-past three, and four. Labour pains of considerable intensity commenced soon after the first dose, and continued to increase till half-past four, at which time a still born male child was expelled. The head was rather large and firmly ossified, but considerably moulded by its passage through the contracted brim. The placenta followed almost immediately. At bed-time the patient took an anodyne draught, followed by a dose of castor oil in the morning. The bowels were comfortably relieved. The after-pains were slight, and the secretion of lochia and milk was natural. The recovery was rapid and uninterrupted.

Labour commenced immediately after the sixth use of the douche, and thirty-six hours after the first use of the douche. Duration of labour, eighteen hours.

The account of the foregoing case has been most correctly drawn up by Mr. Rake, the house-surgeon to the hospital. It is evident, that in this instance, though the child was lost, the chances of its being born alive were considerably greater than if the membrane had been punctured before the commencement of labour. In the present case, the membranes were ruptured after the os uteri had been completely dilated by the influence of the douche. Should another case of this description come under my care, I should allow the liquor amnii to be discharged without any interference. The patient returned to her home in the country a fortnight after her delivery; and in passing through the village in which she resides a few days ago, I called and found her quite well, and in the full employment of her domestic duties. I should wish to state, that I resorted to the operation entirely from perusing the successful case related by Dr. Tyler Smith in 'The Lancet' of October 2nd.—*Lancet, Dec.* 4, 1852, *p.* 517.

94.—OBSERVATIONS ON THE INDUCTION OF PREMATURE LABOUR BEFORE THE SEVENTH MONTH OF PREGNANCY.

By Dr. Robert Lee, F.R.S.

[In a paper read before the Medical and Chirurgical Society, Dr. Lee said that]

In the year 1812, in the third volume of the 'Transactions' of the Society, Dr. Merriman had published a paper entitled "Cases of Premature Labour Artificially Induced in Women with Distorted Pelves, to which are subjoined some observations on this Method of Practice." The author thought it significant that in thirty-two volumes of the 'Transactions,' embracing a period of forty years there did not occur the history of a single case to illustrate this important rule of practice; while in these volumes there were reports of ten cases of Cæsarian operation. Of the safety, efficacy, and morality of inducing premature labour, in conformity with the rules inculcated by Mr. Merriman, the author thought most British and some foreign practitioners were convinced; but in respect to the induction of premature labour before the

seventh month and in first pregnancies, to obviate the danger of craniotomy and the fatal effects of the Cæsarian section, in cases of great distortion of the pelvis, little had been said by writers on midwifery. To justify the practice, which the author regarded as equally safe, efficacious, and moral, before, as after the seventh month of utero-gestation, and in a first as in any subsequent pregnancy, he submitted the history of a successful case, which was attended with peculiar complications and formidable difficulties.

In October, 1849, with Mr. Booth, of Queen-street, Westminster, he saw Mrs. S——, who had been in labour forty-eight hours, and whose pelvis was distorted in the highest degree from mollities ossium. After perforating the head, which had not entered the brim of the pelvis, and by tearing in pieces the bones with the crotchet, delivery was accomplished after two hours' violent exertion. The partially dilated state of the os uteri greatly increased the difficulty and danger of the operation. The patient recovered without any unfavourable symptom. In December, 1852, the author learnt from Mr. Booth that the patient was again pregnant; and in the fifth month, some diagnostic symptoms of pregnancy being absent, any interference was postponed for another month. In January, 1853, the movements of the fœtus could be distinctly felt, and the necessity for immediately attempting to induce premature labour was obvious and urgent. The great distortion of the pelvis (the tuberosities of the ischia were almost in contact, and the sacrum projected forward nearly to touch the front of the pelvis) presented unusual difficulties, seen in reaching the os uteri for the purpose of introducing the stiletted catheter to puncture the membranes. After a time, the fore and middle fingers of the left hand were passed into the vagina, and the anterior lip of the os uteri was touched with the tip of the forefinger; the instrument was then guided into the cavity of the uterus, and the membranes punctured. The liquor amnii continued to flow till the morning of Friday, the 7th of January, when labour pains came on. At two p.m. the os uteri was so much dilated that the points of two fingers could be introduced, and the nature of the presentation ascertained. It was not the head, but whether shoulder or nates could not be determined. At seven p.m., the right hand was hanging out of the external parts, and the shoulders and thorax had sunk deeper into the pelvis. On a careful examination, it was found that the tuberosities of the ischia had been pressed considerably apart, the short diameter of the outlet being thus increased; and there was little doubt but that the bones at the brim had also yielded somewhat to the pressure. The shoulder being brought down as much as possible, the viscera of the thorax were removed by the crotchet; and after fixing its point in the spine as near as possible to the pelvis, after strong traction, the nates and lower extremities were drawn through, and the other superior extremity soon followed. But little difficulty was experienced in crushing or extracting the head. The placenta soon followed. Three weeks after the delivery, the author received a satisfactory communication from Mr. Booth, stating that the patient had progressed very favourably.

[Mr. Hodgson, the president, inquired what was the smallest diameter of the pelvis which would admit of the removal of the fœtus piece-meal?]

Dr. Lee said that his object in narrating the case was to bring under the consideration of the Society the propriety of inducing premature labour, in certain cases, before the seventh month of pregnancy, to prevent the necessity of resorting to other and dangerous operations. With respect to the production of premature labour after that period, full discussions had taken place. With regard to the question put by the President, he might remark that it was most difficult to determine the exact measurement during life, but that he had never seen a pelvis with a less diameter than in the present case; and after this he felt confident that if premature labour was induced before the seventh month, no case could occur in which delivery could not be effected. In this case, also, it might be remarked that the diameter of the pelvis had been increased by the pressure of the head of the child, in consequence of the bones being affected by mollities. This might reasonably be expected to occur in cases of a similar kind. He wished to know if any one objected to the course of proceeding which he had recommended previous to the seventh month, to prevent the necessity of craniotomy, or of the Cæsarian section. He might here remark that he had the best reason to believe that one fatal case of Cæsarian section had occurred since the discussions on that subject before the Society; and this, too in an instance in which it would not have been so difficult to effect delivery as in the case before the society. That operation, however,—he meant the Cæsarian section,—had not been recorded.—*Lancet, Feb.* 19, 1853, *p.* 186.

95.—*On the Relations between Menstruation, Conception, and Lactation, and the Influence of Lactation in causing Abortion.* By Dr. Robert Barnes, Obstetric Surgeon to the Western General Dispensary.—[These are the conclusions Dr. Barnes arrives at, after a careful enquiry into the subject:]

First. Lactation exercises a considerable influence in preventing menstruation and conception.

Secondly. This influence appears to be marked and constant in some women, and to exist but feebly in others.

Thirdly. The influence of lactation in averting menstruation or conception, cannot for the most part be kept up longer than twelve months.

Fourthly. There is a close relation between the occurrence of menstruation during suckling and conception—*i. e.*, when menstruation appears during suckling, conception is very likely to follow.

Fifthly. When pregnancy takes place during suckling, and suckling is continued, abortion is very apt to follow.

Sixthly. The chief causes of the abortions brought about during suckling, are the revolt of the ovaria and uterus, evinced by the return of the menstrual nisus, and the deterioration of the mother's blood; to which must be added, superinduced disease of the ovum.

Seventhly. The practical conclusion that weaning should be enjoined, not only whensoever pregnancy takes place, but also whensoever menstruation returns.—*Lancet, Dec.* 4, 1852, *p.* 513.

96.—USE OF TARTAR EMETIC IN TEDIOUS LABOURS.

By J. STEDMAN, Esq., Havant.

Case 1. Jane Clark, aged 27, of a weakly constitution. Sent for on on the 16th of October, 1852, at 2, a.m. Found, on examination, that labour had scarcely commenced, although she fancied, from having had spurious pains for some days before, that it would soon be over. I comforted her as well as I could, and went home. On calling at ten o'clock (eight hours after my first visit) I found the os dilated about the size of a shilling, pains not frequent, and of very little service. I left her, desiring I might be sent for if she got much worse; and at seven, p.m., I was again with her. The os had dilated a very little; the pains were very slow and inefficient; the edges of the os soft, and all the parts moist. I gave her ant. tart. gr. $\frac{1}{4}$, pot. nit. gr. x.; repeated it every half hour. The first dose made her sick, pains came on quickly, and the labour was over at twelve o'clock, so that she was in labour only twelve hours, (no very long time for a first case); and I am quite convinced she would have been out of it much sooner if I had given the tartar emetic earlier; and I am equally convinced that, had I not given it, she would have kept me many hours longer.

Case 2. Mary Gover, aged 24, strong, healthy woman. Sent for at one, a.m. on the 21st of September. Found her sitting up, complaining of much pain, and surrounded by three women, who thought it was time I was sent for, as the pains were so strong. On examination, I found the os dilated about the size of a four-penny piece, and very rigid; pains very few and far between, and having scarcely any effect. I remained with her about two hours, just to please the anxious attendants, and then left her, and returned at eight, a.m. She had had a great many very strong pains, (to use the expressions of the friends); and, on examination again, I found the os had certainly dilated a little, but a very little, and the edges were very hard and unyielding. I gave her ant. tart. gr. $\frac{1}{4}$, pot. nitratis gr. x., and repeated the dose every half hour for three doses. The effect was magical; the edges of the os became soft and yielding, the passages moist with abundance of mucus, labour progressed rapidly, and, at about half-past ten, it was all over. The second dose of the medicine made her very sick, and she threw up a great deal of bile. Now, in this case there was nothing particular to call for interference; the woman had only been in labour eight hours, and, for a first case, was doing well, and would doubtless have done very well if I had waited patiently; but, knowing the advantages of the tartar emetic, I used my best endeavours to make a short labour out of a long one, and succeeded admirably.

Case 3. Elizabeth Jones, aged 24, wife of a travelling hawker, a fine, healthy country woman. Sent for May 1st, at four p.m. Found every thing all right; the os uteri just commencing its functions, but with every appearance of being "a long job." As it occurred close to my house, I left her, and sent up a mixture with nit. potass. ʒj., ant. tart. gr. iss., and desired the nurse to give her at once a quarter part of it, and continue it every half hour. It made her very sick; and at eight p.m., I was again sent for. I found the head coming down beautifully; and, at half-past nine o'clock, she and I were released.

I regret that I have not made notes of many other cases which have occurred in my practice, both of first labours and of lingering ones, occurring in women who have had families, in which the above plan has been so successful; but I think the three cases mentioned will prove the efficacy of my favourite remedy.

Remarks.—Although it is pretty generally admitted that tartar emetic has a very powerful effect on the uterus, and that in lingering labours it is very frequently used, still I think its efficiency is not so fully appreciated as it ought to be; and I am of opinion, after having constantly used it for the last ten years, that it is invaluable, not only in nearly all cases of lingering labour, but in very many first labours, in which there are no untoward symptoms, and which only exhibit that tediousness so generally incidental to primiparæ. Of course, I do not for one moment advance this plan of treatment as anything novel, because it has been tried by many of our most eminent accoucheurs; and I only refer to it now because I am convinced that much suffering may be mitigated, and that many a weary hour of watching by the bedside may be avoided by its judicious application; and this more especially in country districts, and among the lower orders, where, in a common, everyday, natural, first labour, you are sent for the moment the os uteri begins to dilate, and where, unless you are pretty well up to midwifery, you may be made to wait until it is all over, subjected, in very many instances, to all the annoying remarks and ignorant observations of two or three old women, who are quite sure that something ought to be done, and that, "whenever I have been with Mr. Jones or Mr. Jenkins, they have always helped the poor creature."

I repeat, that a great deal of this annoyance may be avoided, and that, independently of this, which is, after all, but a minor point of consideration, a great amount of suffering may be saved by giving the tartar emetic. I have selected three cases which have lately come under my care to illustrate my meaning; and they will be found to be types of thousands of others which will occur to the minds of practitioners.

I trust that in making these few remarks, although I may not be advancing anything very new or very brilliant, I may be the humble means of directing the attention of some of my younger brethren, at any rate, to a very useful practice, and a very safe practice; one as serviceable in the first stages of labour as ergot is in the subsequent ones, and one which in many cases will, I think, be found to supersede the use of the latter remedy. For my part, I make a point of never going to a labour without my tartar emetic, and I would advise every one to do the same.—*Med. Times and Gazette, Dec.* 25, 1852, *p.* 641.

97.—RUPTURE OF THE UTERUS: ABSENCE OF SYMPTOMS.

By Dex Bean, Esq. Halifax.

[The following presents some features different to what are usually met with in such unfortunate cases:]

About five p.m., on Sunday, December 12th, I was called to attend A. D——, aged thirty-eight, in her fourth confinement. On arriving

at the house, I found the patient lying quietly on her bed, and on inquiry I learnt that all uterine action had ceased abruptly about an hour and a half previously. Up to that period the pains had been regular and vigorous, since the commencement of labour in the preceding night. She complained of no pain, with the exception of a little in the right shoulder, which she attributed to her straining exertions; but I found the abdomen was a little tender on pressure; pulse 85, moderately full; extremities and surface generally quite warm. On examining per vaginam, I found the os uteri very high up, not very fully dilated, but quite dilatable. Beyond the os, I felt a hard body, which I supposed to be the head; but, having considerable difficulty in reaching it at all, I could not feel either fontanelle or suture, to point out the precise presentation. From the manner in which the pains had ceased, I was apprehensive that rupture of the uterus might have occurred; but in the absence of any tendency to collapse, pain, or other marked symptom likely to result from such a formidable injury, as well as from the fact of my being unable to detect any trace of the fœtus through the abdominal parietes, I was not without hope that my conjecture might prove unfounded.

As there were no symptoms denoting any immediate urgency in the case, I determined to comply with the wish expressed by the relatives, that I would wait a short time, to afford an opportunity for the labour to terminate naturally, if haply my fears respecting it were erroneous. I therefore returned home, leaving instructions that I was to be summoned instantly if any change occurred; and under any circumstances I was to hear from them between seven and eight, p.m. A few minutes before eight, the husband came to inform me that his wife remained in the same condition. I went with him at once, and found, on making an examination per vaginam, that the head had receded, and was no longer within reach of my finger. The os uteri was perfectly dilatable, and on placing my hand over the abdomen, the uterus could be felt high up above the umbilicus, and communicated a sensation of great flaccidity.

The pulse was a little quicker, about 92; the abdomen rather more tender, but the whole constitutional symptoms were still very slightly marked. However, as she had not experienced a single pain since a little after two, p.m., and the pulse was beginning to increase in frequency, I determined to delay no longer, but introduce my hand cautiously and bring down the feet, a proceeding that, from the relaxed state of the uterus, I was sanguine might be accomplished without any additional injury to the uterine structure. I therefore called some of the friends aside, and informed them that I was of opinion the absence of the pains was owing to a severe internal injury having taken place during the last pain, a little after two p.m.; that there was no hope of the labour terminating naturally; and that as the woman was growing weaker, I would proceed to deliver the child at once, as being the only measure which gave the patient the slightest chance of recovery. I prepared to carry my intentions into effect, when, to my surprise, the relations interfered, and refused to allow me to "lay hands on her" until after the arrival of the Catholic priest, whom they had already privately sent for From deference to their prejudices, and as they stated that the priest would arrive in a few minutes, I consented to await his

coming; but it was not until an hour and a half's waiting had completely exhausted my patience, and I was taking my departure, that he made his appearance. I returned with him, and, after explaining the case to him, I made another attempt to induce them to allow me to proceed; but they obstinately persisted in waiting until morning, in hopes of the case terminating naturally. I did all in my power to convince them of the extreme folly of such delay: but in vain. As the woman herself likewise expressed the same determination, and of course I could not consent to retain the responsibility attached to the case unless I was allowed to adopt the appropriate treatment, I at once informed them that with their refusal my connexion with the case definitely ended; and when they thought proper again to seek for medical assistance, it would be useless to apply to me, as I should not attend under any pretence whatever.

From the evidence given at an inquest on the body, held the ensuing Tuesday, it appeared that some slight pains occurred about an hour after my departure, but no medical man was sent for till the following morning, when Mr. Hodgson, surgeon of this town, was asked to attend. On his arrival, however, about ten a.m., he found that the woman had expired about half an hour previously. Acting upon the possibility of the child being still viable, he at once performed the Cæsarian section; but on dividing the abdominal parietes, he discovered both child and placenta lying among the intestines, the child quite dead, and on examining the uterus, found an extensive laceration of the cervix.

In accordance with the evidence, the jury returned a verdict of—"Died from rupture of the uterus, after having repeatedly refused medical assistance."

The foregoing case appears to be instructive, as showing how slight the symptoms marking such a terrible accident may occasionally be; for, after the lapse of two hours, the pulse was only 85, the skin warm, and, comparatively speaking, no abdominal pain was complained of. Indeed, it was only the abrupt cessation of the pains, conjoined with the description given of the last one, that made me at all suspect the nature of the accident on my first visit; and even at ten p.m., the period of my final departure, the pulse had not reached 100, and the tenderness of the abdomen was not greater than I have frequently found present in lingering labours. This may, perhaps, in some measure be accounted for by the fact, that the liquor amnii had been discharged very copiously in the early part of the labour; and as the shock appears to have at once paralyzed the uterus, probably very little of its fluid contents came in with the peritoneal surface.—*Lancet, Jan.* 8, 1853, *p*, 30.

98.—CASES OF HEMORRHAGE AFTER DELIVERY ACCOMPANIED BY SEVERE AFTER-PAINS.

By Dr. Francis H. Ramsbotham.

It is generally believed, and with truth, that the more strongly the uterus contracts after delivery, the less chance is there of hemorrhage occurring; and the greater, therefore, is the safety of the patient in

respect to that source of danger. This aphorism, however, only applies to those cases in which the uterus is empty; if it contain any solid body —a polypus, for instance, as I have before shown, a portion of placenta adherent to its surface, a large piece of the fœtal membranes, or even a mass of tough, fibrinous coagula—it may contract most powerfully—indeed, inordinately—with much more pain than usually attends its action after the child's birth; and yet, at the same time, there may be such a discharge of blood flowing as to place the patient's life in imminent peril.

These cases are embarrassing to the young practitioner, especially as there exists among authorities on the obstetric science, a great diversity of opinion in regard to the treatment of floodings after the removal of the placenta; and this want of concord must necessarily tend in no small degree to confuse his judgment. Some, as Denman, Dewees, and Robert Lee, think the introduction of the hand for the purpose of clearing the uterine cavity too harsh a measure to be admissible under such circumstances; while others, as Burns, Collins, Gooch, Merriman, and my late father, describe the proceeding as being not only safe in itself, if carefully performed, but as the speediest and most effectual means of averting the impending danger. Others, again, as Blundell, Ingleby, and Churchill, think it should never be attempted, unless there be "inexorable need," or "a very pressing emergency," or till "all other means have failed."

I propose to report a few of the cases that have occurred in my practice, where a quantity of tough coagula, collected within the uterus, gave rise to intense suffering and other alarming symptoms, as a type of the kind of cases to which I refer, and as an exemplification of the practice that I have followed for some years with very satisfactory results.

The fact of my having seen the first seven cases that I shall relate, all in one year, is a proof that they are not very rare, but that they are met with often enough to make them well worthy of special consideration.

Case 1. On February 2nd, 1853, at five a.m., I was sent for to Mrs. S., aged 32, in the neighbourhood of Drury-lane. She had been in labour of her first child for two days, the membranes having broke on the first accession of pains; and she had been rather officiously treated, for her attendant had exhausted his stock of ergot, and had given her a considerable quantity of gin and water; she had taken two large doses of laudanum; and he had been rubbing some extract of conium on the cervix uteri; he was about to bleed her when I arrived. I found her walking about the room, unable to sit from the pressure of the child's head, looking weary. She had not slept for two nights, but the pulse was under 90, and there was no indication of exhaustion. The os uteri was not quite dilated, though the head was low in the pelvis; the scalp was puffy and swollen; the vagina and perineum very rigid; and the pains were frequent and irritating. I ordered her a little effervescent medicine, and directed that she should be kept quiet on the bed, and that the external parts should be fomented. At two p.m. I ascertained that the pains had been much more natural and efficient since the meddlesome practice had been discontinued; the os uteri was entirely dilated, the vagina much more lax, and the head extending the perineum. The

child was born at three. The placenta was expelled naturally in fifteen minutes, but the uterus soon relaxed, and a quantity of blood collected within its cavity. Pressure and cold caused it to contract; still there was a draining of coloured serum going on, and the uterus was acting at intervals very strongly, with much pain. After waiting nearly half an hour, without any relief to the symptoms, during which time she became rather faint, I introduced my hand fully into the uterine cavity, and removed four or five ounces of firm, fibrinous coagula. The draining then ceased, as did the pains also; and she soon went to sleep. It was necessary to introduce the catheter once the next day; but she recovered perfectly well.

Case 2. On April 27th, 1833, at two p. m., I was requested to see a patient of the Royal Maternity Charity, who had been delivered of her first child by one of the midwives, about two hours before, after an ordinary labour. The placenta came away without assistance, in less than half an hour; but the uterus relaxed, and she flooded much. The midwife had used cold applications and compression of the viscus; and although these means had produced strong contraction, attended by unusual pains, they had not put a stop to the discharge. The patient was complaining of acute suffering each time the uterus acted, was faint, pale, and in a state of jactitation. I therefore introduced my hand at once into the cavity, and took away a mass of firm coagula, the size of a man's fist. The violent pains ceased immediately; the bleeding was stayed; and, after experiencing for a few days a pulsating pain in the head, she gradually recovered.

Case 3. On the next day, April 28th, at eleven p.m., a medical friend sought my assistance for Mrs. A., Burr-street, Wapping, in labour of her ninth child, at full time. He had been called to her an hour and a half before my arrival, and found her flooding violently. The discharge was much arrested when I saw her, though it had not quite ceased. The pains were feeble; and I could just touch the edge of the placenta at the posterior part of the neck of the uterus, the mouth being dilated to the size of a crown-piece. As there was no faintness, I allowed the case to go on uninterfered with for an hour. At the end of that time, however, the hemorrhage returned, and I therefore ruptured the membranes. The uterus now began to act more powerfully, and the child was born at half-past two. The placenta was expelled into the vagina in half an hour, whence I removed it; but the uterus relaxed, and flooding came on. For nearly two hours I used compression with my hand, and continued to apply cold vinegar and water without intermission. During a great part of this time the uterus relaxed and contracted alternately; at last it became quite firm, though larger than it should have been. Notwithstanding its hardness, and the powerful spasmodic action that it took upon itself, the hemorrhage did not cease. She was in great pain every time a contraction occurred, became restless, and began to yawn. Feeling anxious for her safety, I passed my hand within the uterus, and brought away a quantity of very tough coagulum, as much as would fill a common-sized tumbler, part of which was almost white, the red globules of the blood having been squeezed out of it.

From that time the pain and discharge both ceased. I left her at seven o'clock, and her restoration was unchecked.

Case 4. On May 11th, 1833, at half past eleven p.m., a physician residing in the city came to me in great haste, to beg I would go immediately to the assistance of his wife, whom he thought dying. She had been delivered of her third child, under the care of a mutual friend, nearly two hours. The placenta passed in twenty minutes after the infant; but she was soon seized with violent uterine pains, accompanied with considerable hemorrhage; and she became faint. I found her very pallid; the pulse at the wrist was scarcely perceptible; the uterus was acting every four or five minutes with excruciating agony; and there was a copious serous discharge from the vagina, only slightly tinged with red. The uterus was much larger than it ought to have been, but exceedingly firm. Believing it to contain a quantity of coagulated blood, I proposed the introduction of the hand, for the purpose of emptying the cavity. This was readily acceeded to; and I removed more than half a pint of very tough, solid clots. I had some difficulty in passing my hand through the mouth; and some, also, in separating the fibrinous matter from the internal membrane, for it adhered with considerable tenacity; however, I got it all away. From that time the agonising pain abated, the hemorrhage ceased by degrees, she soon fell into a slumber, and had a good and quick recovery.

Case 5. On July 24th, 1833, at half-past 11 p.m., a medical friend called me to the wife of a tradesman in Bishopgate-street, who had been delivered of her fifth child four hours. I was told that the placenta had come away in ten minutes after the child's birth, without any trouble or hemorrhage; that her attendant had left her, and was re-called in an hour, and that he then found her suffering from severe after-pains, with considerable flooding. When I arrived, she was very faint, cold, and restless; the after-pains were frequent and very distressing; and the uterus was large and hard. Being quite sure that it was not empty, I passed my hand within the cavity, and took away a large quantity of firm coagula, among which were entangled some filaments of placenta, that had been adherent to the uterine surface. I met with much resistance in introducing my hand, in consequence of the strength of the uterine contractions, and had some trouble also in separating the pieces of placenta, on account of the firmness of their adhesion. But the organ having been emptied, the pain and hemorrhage immediately ceased, and the woman was restored without a bad symptom.

Case 6. On July 26th, 1833, at seven p.m., I was summoned to Mrs. J., in Aldgate, whom I had engaged to attend. It was her fifth child; the membranes broke on the 24th, and she had been uneasy ever since. Labour was considerably advanced, and she was delivered at half-past eight. The placenta was expelled without hemorrhage in twenty minutes, and I left her before ten. In an hour I was sent for again. She was then suffering most intensely from after-pains, was faint, and frequently vomiting. The uterus was large and very hard. She had evidently lost a great quantity of blood since I had left her, and there was a copious flow still going on. I introduced my hand, without loss

of time, carefully into the uterine cavity, and extracted about half a pint of heavy, tough coagulum. The pain instantaneously left her, the hemorrhage abated gradually, and at twelve o'clock she was in a state to admit of my departure. She suffered from symptoms of re-action for a few days, but got about, as early as she ever had done after any of her previous confinements.

Case 7. At one p.m., August 18th, 1833, my assistance was sought by a medical practitioner, for Mrs. C., Hoxton, who had been delivered of her first child three hours. The placenta had been retained by irregular contraction, and removed from the uterus by the hand; previously to which she had lost about two pounds of blood. When I arrived, she was faint, cold, and pale; the pulse was very small; the uterus was excessively hard, and rather larger than natural; there was an uninterrupted draining going on, and she was suffering excruciating pains at intervals, evidently proceeding from uterine contractions. She had taken three drachms of laudanum without relief. I passed my hand into the cavity with considerable ease, notwithstanding the strength of the uterine contractions, and removed a quantity of the same kind of tough, fibrinous coagula, as existed in the other cases that I have narrated, considerably larger than an orange. She felt immediate freedom from pain, and the discharge ceased almost as suddenly. She became a little faint, but soon rallied; at four she was sleeping comfortably; and her recovery was uninterrupted.

In all these cases there was a draining of blood going on at the same time that the uterus was firm and comparatively small, and while the after-pains were frequent and powerful,—a condition of things usually described as being incompatible with dangerous hemorrhage. In all there was a considerable quantity of heavy, tough, coagula within the cavity, and in all the pain ceased immediately the uterus was emptied, the discharge being almost entirely put a stop to equally speedily.

The pain is no doubt produced by ineffectual attempts on the part of the uterus to expel the offending mass within its cavity; and the very efforts set up for this purpose rather retard than further its escape; for, by compressing the coagula so powerfully, the more fluid parts are squeezed out, the firmer remaining behind; and the fibrinous clot thus left clings with such tenacity to the uterine walls as to be almost as difficult of separation by the unaided uterine contractions as a piece of adherent placenta itself would be. Hence the necessity for the manual removal; hence, also, the sudden cessation of the hemorrhage, and of the intolerable pains consequent on that measure being adopted—*Med. Times and Gazette, March* 26, 1853, *p.* 316.

99.—PECULIAR CASE OF ACCIDENTAL UTERINE HEMORRHAGE.

By I. Harrinson, Esq., Reading.

[Mr. Harrinson was summoned to this patient on July 11th, 1832, at half-past eleven o'clock, a. m. She was about thirty-six years of age, and seven and a half months advanced in pregnancy. He says:]

From her distressed condition, I could only gain the following particulars as to the method of her seizure. She was sitting in her kitchen, between nine and ten o'clock, a.m., preparing some culinary compound, when she suddenly felt faint; her bowels were twice moved in quick succession, and severe pain in the abdomen immediately succeeded. At half-past ten o'clock I found her lying on a sofa, complaining of faintness and of extreme pain in her abdomen. She fancied that labour was coming on. There was no discharge. Some brandy was given, and she rallied. I requested that she should be got to bed, and promised to see her again in an hour.

On my return, she was more distressed, more faint, and in more pain; in a few words, she was in a state of collapse.

On examination externally, the abdomen was very tense, and the seat of pain was principally at the fundus of the uterus, which reached and occupied the epigastric region. The pain was that of distension, of bursting, and indescribably distressing.

On examination *per vaginam*, I discovered the cervix uteri not obliterated, the os uteri just admitting the finger, the membranes unruptured, and the head presenting.

Amid the enveloping agony, she was now and then slightly conscious of the pains of labour.

I determined at once to rupture the membranes, which was readily accomplished. The waters flowed profusely and clear; there was not a trace of blood. About this time she had a convulsion, during which life appeared to be all but extinguished..

Dr. Cowan now saw her, soon after one o'clock, p.m. After a careful examination, we agreed that a grave accident had happened, but could not determine its precise nature, nor its seat; nor whether it was perforation or rupture of some abdominal or pelvic viscus.

From, however, the condition of pregnancy, and the absence of any other recognized disease, we felt justified in thinking that the uterus must be the organ involved, and that rupture, partial or complete, of that organ had probably occurred.

The indications appeared to be, to relieve the pain, and to keep up the failing powers as well as possible, which were attempted to be fulfilled by opium and by brandy. One drachm of tincture of opium was given immediately, and brandy and water at frequent intervals. There was an almost incessant cry for cold water, which was ungrudgingly supplied.

Three o'clock, p.m. Much the same; no relief. The same dose of tincture of opium was repeated. The os uteri was progressively dilating.

At five o'clock Dr. Cowan again visited her. I proposed that we should spare her little remaining strength, by now completing labour with the perforator and the forceps; premising, of course, that that could be done readily and with safety. Dr. Cowan agreed. The head was perforated and extracted with little difficulty. In a short time, one hand being kept firmly applied to the abdomen, the body readily escaped. Without waiting to separate the child, the hand was still kept on the abdomen, and I was surprised to find that it had scarcely diminished in size or in tension.

Firm pressure was kept up, and I was about to observe to the nurse that we had one or two more children to come, when one of the most fearful gushes took place I ever witnessed. Placenta, clots, and fluid blood, to the amount of some quarts, were expelled at the same instant. The uterus was at once carried down into the pelvis, and there fixed with the hand. There was no further escape of blood. The uterus showed no disposition to relax, nor did it apparently in the slightest degree.

She was immediately relieved of that dreadful feeling of distension, and lay easy for a time. Anticipating what was to follow, while I was guarding the uterus, the nurse was employed in giving as much brandy and water as she could get down. Another drachm of tincture of opium was given. It was now about half-past six o'clock. After a short time the restlessness increased; she tossed about incessantly, and the extremities became cold. At eight o'clock she apparently fell into a quiet sleep. At half-past eight o'clock, Dr. Cowan again saw her. It was agreed to let her sleep a little longer. She slept, but it was the sleep of death. At ten o'clock her breathing was observed to change, and in a few minutes she died, twelve hours from the time she was first seized.

Autopsy performed next morning. Dr. Cowan was present. The uterus was found well contracted: no blood was discovered within it. No appreciable disease in any organ.

I may here remark, that the cord was twice round the neck of the child, and was very short. I much regret that I did not measure it. There was no disease of the placenta.

What occurred, then, to produce so lamentable an accident, undoubtedly was, a sudden separation, probably nearly entire, of the placenta from the uterus; and the only discoverable cause, an unusual shortness of the umbilical cord, and that twisted round the neck of the infant.

In the retrospect of such a case, a few points present themselves for consideration. Could a more accurate diagnosis have been arrived at? and if so, could the treatment have been materially modified?

To describe her condition in a few words, it may be said, that she was in a state of collapse, with extreme pain. These symptoms, however, would equally belong to perforation or rupture of any of the abdominal or pelvic viscera, or even to the rupture of an aneurism.

The only characteristic I could name, would be the state of the abdomen. It was distended to the utmost; was dull on percussion; and had an unusual, peculiar, doughy feel.

Her strength was supported after the most approved methods, and opium, that sustainer of the vital energies, was carefully administered. Labour was accomplished as soon as the state of the uterus allowed. When the uterus was emptied, no further discharge was permitted.

No example at all similar has occurred to me before. No writer that I can find has described one exactly corresponding; and some authors do not even name the possibility of such an occurrence. Dr. Robert Lee, in his "Clinical Midwifery," Dr. Copeman in "Crosse's Midwifery," Drs. Churchill, Ramsbottom, and Blundell, &c., give good cases and descriptions of "*accidental uterine hæmorrhage,*;' as ordinarily

happening; but I can find no author giving an account of the diagnosis of such cases as the one related, where no discharge appears externally.

[In this case we think it would have been better simply to rupture the membranes if they could be easily reached, but not to hasten away the child by the steps here adopted. Even rupturing the membranes in such a critical case was a doubtful practice.

What was the case?—sudden syncope or faintness with great distention of the abdomen. This would indicate internal bleeding. What would stop the bleeding most effectually for the time till the patient could rally?—the coagulum at the mouths of the vessels supported in its position as it would be by the fœtus, membranes, &c.; withdraw this plug and the hemorrhage would almost certainly return. Therefore the practice would naturally be to keep the plug there till we saw a fit occasion to allow it to come away. Bringing the child away and emptying the womb by artificial means would insure the separation of this plug at a time perhaps when the woman was not fit for such a process. We should say, therefore, in such a case:—

1. Give stimulants in moderation and keep the woman horizontal.

2. If syncope continued rupture the membranes, give a good dose of ergot of rye, and keep up the patient as well as you can by stimulants and food, but dont bring away the child yourself—let the womb expel it, and be ready the moment the child is born to compress the fundus uteri with a cold hand or cold wet towel, so as to compel it to contract rapidly and to expel placenta and coagula. If you save the woman from the first gush of blood you will probably save her altogether. Ed.]—*Association Med. Journal, Jan.* 7, 1853, *p.* 11.

[Mr. King, of Bath, after referring to Mr. Harrinson's case, related above, makes the following remarks upon the treatment employed. He says:]

After the rupture of the membranes, a full dose of the secale cornutum might, I think, have excited the contracting power of the uterus, and, by its stimulating quality, have kept up the failing powers. The mode of delivery I do not consider to have been the most safe and proper. The blunt hook would have been a much safer instrument, and more applicable than the perforator or forceps. As there was no propelling action of the uterus, and the head presented, there would have been no difficulty in introducing it, and of getting a good hold. The child, I suppose, was dead, and it would not have been of much consequence to what part we had fixed it. The chin, occiput, and mouth, were to be easily got at, and there appears to have been no rigidity of the os uteri, resistance, or want of repose. There was only a lack of physical power: this the blunt hook would have safely and easily supplied. The operation of craniotomy can never, in my opinion, be justifiable, unless there be a hydrocephalic head presenting, or an unusual degree of ossification of the entire bones of the cranium, or a very great degree of deformity and contraction of the pelvic orifice, or a dying patient. I believe it would not be considered orthodox to let a woman die undelivered. The powers of action in this case did not seem to have been exhausted, as she survived some hours after the loss of some quarts

of *fluid* blood. Its being fluid is, I consider, a clear proof that that was not the cause of the previous symptoms; but that the clots resulted from the internal hemorrhage going on before delivery was attempted. We thus possess two means or ways of restraining uterine hemorrhage; firstly, by exciting the power of contraction; and, secondly, by promoting the formation of coagula. Mrs. G. must have sunk from the loss of the quarts of fluid blood. I never lost a patient from hemorrhage after delivery, who survived it an hour.—*Association Med. Journal, Jan.* 28, 1853, *p.* 88.

100.—*Case of Internal Uterine Hemorrhage.* By GEORGE KING, Esq., Bath.—[Mrs. T., in the last month of her fourth pregnancy, after suffering great excitement from some simple cause, complained of a slight pain in the back, and fainted twice within the hour. From the state of alarm induced, Mr. King was sent for. He says:]

It was about two o'clock when I saw her. I found her then on the bed. She appeared much depressed, and complained of tingling pains in the back, and she thought that labour would very soon come on. On examination per vaginam, there seemed to have been no discharge, and I found nothing more than the usual premonitory symptoms of approaching labour. In the parturient passage the mucous secretion was very abundant, and the parts most amply lubricated. The os uteri was thin, and sufficiently dilated for me to introduce my finger with ease. Having fully satisfied myself that there was no external hemorrhage, or any other alarming symptom, I did not interfere. I was with her about two hours. During that time there was no labour-pains, but she still continued to complain of great sinking, and fainted once, and was also sick; still this did not improve her condition, (sickness often excites labour-pains). As she seemed much exhausted, I gave her a table-spoonful of brandy twice, but she kept yawning, and did not rally. The pains were slight, and less frequent, and not so strong as when she was first taken. Yawning and fainting occurring during labour, are unmistakeable symptoms of mischief going on: they must always be looked upon with suspicion, and must create in the mind of an observant obstetric practitioner some degree of alarm, and will require his most prompt and active assistance. As there was no advancement at half-past four o'clock, I then gave a dose of ergot, but it did not increase the pains much. On making another examination, I found the os uteri a little more dilated, and a pouch of the membrane presenting, about the size of a filbert; this I ruptured, but only a very little liquor amnii escaped. I then discovered that it was a natural presentation, and was satisfied that if the pains followed I had nothing to apprehend. Shortly after the membrane was ruptured, the pains became stronger and quicker, and in about two hours a dead child was born, without any unpleasant symptoms succeeding. Before the placenta was expelled, and in a few minutes after the child, a large clot came away with a very slight pain. Although it was not very large, this fully explained the fainting and the other unpleasant symptoms which had been observed

during the day. The clot had no doubt been accumulating ever since the first fainting-fit in the morning; and would have gone on until checked by fatal syncope or labour. The vessels had no doubt ceased to bleed the moment the membranes were ruptured, and the formation of the clot was stopped by the expulsive action and contraction of the uterus. That took place in the afternoon, without producing the slightest appearance of anything like internal or external hemorrhage. It was very evident, from the appearance of the child, that it had not been dead long, and it was very clear that the mother had not gone her full time. She had herself expected to go three weeks or a month longer. I examined the placenta immediately after it was expelled, and there was a rent in its membranous covering, at the root of the umbilical cord; and on the surface of the placenta itself there was a large thick coagulum extending over it, an inch and half in circumference, which was very easily removed. This coagulum was no doubt nature's plug, which had put a stop to the hemorrhage, and all the other unpleasant symptoms.—*Association Med. Journal, Jan.* 14, 1853, *p.* 38.

101.—*Case of Uterine Hemorrhage.* By William Edward Crowfoot, Esq., Beccles, Suffolk.—[The patient in this case had been frequently pregnant, but all the children had been born dead, excepting the last, in consequence of hemorrhage previous to or during the labour. On that occasion, Mr. Crowfoot ruptured the membranes immediately on his arrival, and the child was born alive. In the next labour, in consequence of her poverty, she had hired a midwife, in spite of whose assurances, however, she felt confident she should die, if not immediately delivered. Her fears proved correct, for almost before her husband could leave the house for assistance, she expired. Mr. Crowfoot continues,]

Upon my arrival, an hour after her death, I made an examination per vaginam, and found little or no external hemorrhage, but the os uteri completely dilated, the vertex presenting, and the head firmly wedged in the bones of the pelvis. The midwife could in no way account for the disastrous result, and said that everything appeared to her to be going on naturally; that the patient had no loss of blood, but only complained of a great feeling of faintness.

On the following day, I made a post-mortem examination of the body, which was that of a fine, well-formed female, of thirty-five years of age. Upon opening the abdomen, the viscera were found healthy, but pale and anæmic. The placenta, which had been attached to the posterior surface of the uterus, was separated throughout a large extent from its attachment; and coagulated blood, to the amount of six pounds, with a proportionate quantity of serum, was effused between it and the uterus. The head of the fœtus was so firmly wedged in the pelvis, that I had some difficulty in withdrawing it; and this circumstance accounts for the non-escape of the hemorrhage externally. Had the membranes been ruptured at the commencement of labour, this poor woman's life might possibly have been saved.—*Association Med. Journal, Jan.* 21, 1853, *p.* 59.

102.—CASES ILLUSTRATING THE TREATMENT OF UTERINE HEMORRHAGE.

By Dr. J. M. Winn, Finsbury square.

The following cases of uterine hemorrhage present several points of great practical importance, and may serve to illustrate the treatment required in some of the varieties of this alarming affection.

Internal Hemorrhage before Delivery.—Some months since, I was requested to see, in consultation with Mr. F. Wildbore, a middle-aged lady residing at Stepney, who was in labour of her tenth child. She had been seized suddenly and before labour pains had commenced, with alarming symptoms of collapse, accompanied by a very trifling oozing of blood from the vagina, but not enough to account for the extreme prostration. Before I arrived the external discharge of blood had ceased; yet it was evident from the feel of the uterus that internal hemorrhage had taken place to a great extent, and that the woman was in imminent danger. Although Mr. Wildbore had judiciously administered secale cornutum, the labour pains were entirely suspended. The os uteri was dilated to the size of a crown piece, and there was a head presentation. To deliver in her exhausted condition would have been hazardous in the extreme. The sudden rush of blood which would probably have followed the extraction of the child, during the torpid condition of the uterus, led me to suggest the use of stimulants, and to quietly watch their effects, before having recourse to the operation of turning. The result justified my decision. In a short time uterine pains came on, the head descended, and the labour terminated naturally.

Although the distinction drawn by Mr. Rigby, of Norwich, between those forms of hemorrhage, occasioned by separation of the placenta from the body of the uterus, as in the above case, and such as are produced by its being placed over the mouth of the womb, is of the utmost practical value, nevertheless it appears to me that the terms "accidental" and "unavoidable," which he and the majority of modern writers have used to designate these varieties, are not only objectionable but illogical. Who will say that the hemorrhage in the above case was not unavoidable as well as accidental, although the placenta was not situated over the mouth of the uterus.

Hemorrhage after Delivery.—The following case which I recently attended with Mr. Kisch, of Circus-place, was remarkable from having occurred at a considerable period after delivery, and from the alarming symptoms which followed the loss of only a small quantity of blood, probably amounting to not more than ten ounces.

The patient, Mrs. I——, of Spitalfields, a stout but pale-looking woman, twenty-six years of age, was delivered of her second child twelve days before I saw her. Mr. Kisch informed me that the hemorrhage appeared for the first time on the ninth day, but quickly subsided. She then appeared to be going on well until the twelfth day, when the hemorrhage returned, accompanied with extreme prostration. Mr. Kisch had succeeded in stopping the hemorrhage before my arrival; but a most alarming state of collapse remained, associated with distressing sickness. Mr. Kisch and myself remained in close attendance the whole of the

night, and it was with the greatest difficulty that life could be sustained. Frictions, sinapisms, brandy, and opium, were incessantly required during the lengthened space of eight hours, and reaction was not clearly established until the expiration of that period. The patient ultimately did well under a tonic regimen.

The points of interest in this case are the occurrence of hemorrhage at an unusually long period after delivery, and the remarkable depression which ensued on the loss of the comparatively small quantity of blood.

External Hemorrhage before Delivery.—Last new year's eve I was summoned in haste to a Mrs. D——, a delicate woman, aged thirty, residing in the neighbourhood of Finsbury-square, and who had been seized with flooding in the seventh month of her sixth pregnancy. The loss of blood was considerable, but no very alarming symptoms had ensued; it was, however, clear that if the hemorrhage was not speedily checked the powers of life must soon fail. The os uteri was rigid and dilated to the size of a shilling. As all external applications and internal remedies had failed to stop the flooding, I immediately gave a strong dose of ergot, and proceeded to hasten the delivery by puncturing the membranes. Shortly afterwards pains came on, and, as soon as the parts permitted, I brought down the feet, (it was a case of breech presentation), and delivered her of a dead child. The placenta followed in quick succession, and the uterus contracted firmly. With the exception of general debility, my patient did not suffer from a single bad symptom until the end of the third week, when she was seized with headache and pain in the region of the right femoral vein, quickly followed by the usual signs of phlegmasia dolens. It is remarkable that before this attack of swelling of the leg there had been no disorder of any of the functions of the body. The lochia had subsided gradually, and all the secretions were in a healthy state. Occasional leeching, fomentations, and small doses of mercury-with-chalk combined with Dover's powder, soon reduced the swelling of the limb and restored it to its natural condition.

The accession of phlegmasia dolens so late as the twenty-first day is not a very common occurrence, although cases are on record in which it has supervened at a much later period. It is not easy to refer cases of this sort to an extension of inflammation from the uterine veins. The highly fibrinous state of the blood which exists after parturition no doubt predisposes to inflammatory affections, and it is possible that a deposition of fibrin in the vein may precede the inflammation of the blood-vessel and its surrounding textures. The occurrence of phlegmasia dolens in the *lower* extremities is not an invariable rule. In the early part of last year I published a case in 'The Lancet,' in which the disease attacked the upper extremity.—*Lancet, April* 23, 1853, *p.* 382.

103.—ON THE SOURCE OF HEMORRHAGE IN PARTIAL SEPARATION OF THE PLACENTA.

By Dr. F. W. Mackenzie.

[There are many and diverse opinions as to the source of hemorrhage in separation of the placenta. Dr. Robt. Lee says it is "from the valvular-like venous openings in the lining membrane of the uterus, and of

the arteries which are laid open in the separation of the placenta." Dr. Ashwell thinks it is from the open orifices in the walls of the uterus. Dr. Chowne is of the same opinion. Dr. Simpson, on the other hand, believes it to be from the placenta, while Drs. Radford and Murphy suppose it to take place from both the uterine and placental surfaces. Dr. Mackenzie goes on to say,]

These quotations need not be extended; the foregoing are sufficient to show that the opinions of obstetric pathologists by no means coincide in regard to the source of hemorrhage in placental separations, and doubtless this discrepancy of opinion has in a great measure tended to those very opposite rules of practice which have been inculcated by different writers. It occurred to me, that some light might be thrown upon this question by selecting an animal, the organization of whose placenta approximated nearest to that of the human female, exposing the uterus at the full period of gestation, and detaching portions of the placenta, so as to observe the actual source of hemorrhage. This experiment I was enabled very satisfactorily to perform with the kind assistance of Mr. Marshall, of University College Hospital, and the following particulars comprehend a summary of the facts which were observed.

A large pregnant bitch, which it was calculated was within two days of the full period of gestation, was placed under the influence of chloroform, and the uterus was then fully exposed by an incision, made in the course of the linea alba, from the sternum to the pubes. The uterine tissues were now carefully divided over one of the placentæ, and at right angles with this incision another was made along the border of the placenta, so as to admit of an easy separation of the two organs. It was observed, that the portion of the uterus in apposition with the placenta was highly vascular, and bled freely upon being divided; this, however, soon moderated, and then the separation of the placenta was commenced. The moment it was begun, profuse hemorrhage, of a bright arterial colour, took place in a continuous stream from the uterine surface, which had been previously adherent to the placenta. No bleeding whatever took place from the placental surface; and on continuing to detach further portions of the placenta, it was observed that each successive detachment was attended with increased hemorrhage from the uterus, but none from the placenta. In due time, the placenta was entirely detached, but the blood still continued to flow from the uterine surface only.

A second observation was now made with another placenta, and with the same results. No hemorrhage whatever was observed to take place from the detached placental surface, whilst blood poured profusely from the uterine, increasing as the detachment continued.

In a third instance, the placenta was abruptly torn away from the uterus, but blood continued to flow freely from the denuded uterine surface after the separation.

In a fourth case, the placenta, fœtus, and membranes were together removed from the uterine cavity. The investing portion of the uterus contracted immediately on their removal, but still a large quantity of blood was poured out from that portion of its interior to which the placenta had been attached.

The following observations were also made in the course of this experiment, which it may not be uninteresting to subjoin. 1. On detaching the placenta from the uterus, a number of white, elastic, filamentous-looking bands were observed to pass from one organ to the other. These were probably the utero-placental arteries: they were easily torn across, and their divided extremities would seem to close up and retract immediately upon being divided, as their orifices were not afterwards perceptible, nor did any blood issue in jets from the denuded uterine surface. 2. The blood, as I have remarked, which came from the uterus, flowed in a continuous stream, and was of a bright arterial colour. 3. Except from the divided edges of the uterine wound, and the denuded lining membrane of the uterus, no blood escaped from this organ. 4. Although no hemorrhage came from the detached surface of the placenta, whilst the organ was entire, it was yet found on tearing or lacerating it, while it was partially adherent, that blood flowed from the torn or lacerated parts; but this was to a very inconsiderable extent, and instead of being of a bright arterial colour as was that which flowed from the uterus, it was of a dark purple or bluish tint. It should be added, that each fœtus was alive during these observations, and continued to live for some time afterwards.

Thus it would appear in the canine species, that the source of hemorrhage, in cases in which the placenta is partially detached, is exclusively the denuded uterine surface, so long as the placenta is entire; that the blood escapes in a continuous stream, and is of a bright vermilion tint; that no blood comes from any other part of the interior of the uterus; and that although a certain amount of blood may escape from the placenta, if lacerated or torn while still partially adherent to the uterus, this is comparatively small in quantity, and of a dark venous character.

How far these observations apply to cases of partial separation of the placenta in the human subject, is a question to which we can scarcely give a positive answer, until the structure of the placenta of the bitch has been further examined, and compared with that of the human species; more particularly as regards the disposition of the blood-vessels in its maternal portion. We know, for instance, that in the human placenta, the utero-placental arteries open into large cells formed by the inner coat of the vascular system of the mother, and that between these a free intercommunication exists; whereas in the bitch the venous vessels of the maternal part of the placenta do not constitute a cellular or cavernous structure, but in form and distribution resemble ordinary veins. It remains then to be ascertained, before the value of these observations can be determined, whether there be a free lateral communication between these veins throughout, so as to permit the blood injected into them, where still connected with the uterus, to escape at the place where they have been opened by detachment.

Whilst, therefore, I regard these experiments as interesting in themselves, and as affording, in the general analogy which subsists between the structure of the placenta in the two cases, some support to the doctrine that these hemorrhages have exclusively a uterine origin, I must not be understood to affirm, that they are positively conclusive on

this point. As I have already remarked, some further investigation into the structure of the placenta of the bitch is necessary, to enable us to assign to them their true value and significance. This I propose to undertake; and I will communicate the results in a supplementary paper.—*Association Med. Journal, Jan. 7*, 1853, *p.* 10.

104.—ON PROLAPSUS OF THE UTERUS AND VAGINA DURING PREGNANCY AND LABOUR.

By J. H. Houghton, Esq., Surgeon to the Dispensary, Dudley.

[There is a scarcity of information amongst medical writers upon this subject, and the following case is both interesting and instructive. During the whole of pregnancy there was extreme rigidity of the os uteri. Mr. Houghton says:]

Mrs. S., aged about 26, was taken in labour with her second child, on the 13th November, 1851, at 4 p.m. The pains continued feeble and infrequent till 2 p.m. on the following day, and I saw her about four. The head presented naturally; the os uteri was dilated to the size of a crown-piece; the passages were moist; and the membranes had been ruptured about twenty-four hours previously. However, on examining more carefully, I found that the os uteri was close to the outlet; that the walls of the uterus, from the margin of the os to that part of the uterus against which the head of the child pressed, formed a cone about three inches long, the apex downwards, as though the neck of the uterus had dilated simultaneously instead of becoming obliterated before the dilatation of the os commenced. The lips of the os were exceedingly thick, rigid, and unyielding, and indeed the whole of the cone above described presented the same unyielding character. The pains were regular and tolerably strong. As the labour proceeded, the whole mass, uterus and head, came down together, dragging with it the anterior wall of the vagina, and at length obliterating the anterior *cul de sac* of the vagina; and the considerable tumour thus formed dilated the vulva. The descent continuing, and the dilatation of the os uteri hardly progressing at all, the uterus came so low down that the anterior lip of the os uteri was pushed outside the vulva, and the anterior half of the os uteri, and the posterior half of the vaginal orifice together, formed an elliptical opening, through which the head of the child could be readily felt, and if necessary could have been seen. Still the os uteri continued firm, hard, and unyielding, and eventually the whole of the os, with an extraordinary caput succedaneum, protruded from the vagina. Still the rigidity continued, and I began to lose all hope of the dilatation being effected by natural means.

The above is a pretty fair account of what took place until about eight o'clock, p.m., and then things were much in the state described. The patient being a pale, delicate, little woman, venesection was not performed, but tartar emetic in nauseating doses, was given, and nausea was kept up for about three hours. After this, two scruples of laudanum were administered.

At this time the condition of the patient was much as follows:—Os uteri rather larger than a five shilling piece; caput succedaneum protruding through the os; bones of the head pressing on the margin of the os, which was thick, hard, and very unyielding. Pains strong. Anterior *cul de sac* of vagina obliterated with each pain, and a disposition for the whole os uteri to pass externally at every pain. For sometime after the laudanum was given the pains became more moderate, but they never ceased, and at about ten o'clock they returned sharply; the os, if anything, showing more disposition to dilate, though still very firm, hard, and rigid; and I had serious fears that incision of the os uteri would become necessary.

All things considered, I determined to wait and see if the faint hope of dilatation, which seemed to present itself, would be realized, and, whilst waiting to continue the same course of treatment which I had hitherto adopted, and which consisted in preventing the total inversion of the vagina, and entire protrusion of the head of the child and uterus *en masse* during each pain, this accident threatening with each contraction of the uterus, indeed once happening to a considerable extent when I had been late in watching a pain. To effect my purpose I proceeded in the following manner:—Having replaced the uterus and vagina as well as I could, I watched carefully for each pain, and when it was about to commence I passed the fingers of my right hand into the anterior *cul de sac* of the vagina, and the thumb of the same hand into the posterior *cul de sac;* my fingers and thumb thus embraced the os uteri and child's head, and whilst it allowed the latter to press against and dilate the former, I supported the whole mass in its proper position, or nearly so; and thus, as I conceived, imitated nature to the best of my ability by keeping the uterus artificially suspended in the cavity of the pelvis, and maintaining a point of support to the uterus, to allow of the pressure of the child's head upon the os, and hence its further dilatation. For some time the dilatation continued very slowly, and I could feel, from time to time, that some abrasion of the anterior and posterior lips of the os had taken place. The os now very tightly embraced the head, the posterior lip being softish, the anterior very hard and thick. At about half-past eleven o'clock, during a very strong pain, and whilst I was pursuing the same plan, I felt something suddenly give way, and the child was almost immediately born alive; in fact, laceration of the posterior lip of the os uteri had taken place to, I suppose, an inch in extent. No flooding followed, and the placenta came away without any difficulty; except that with it down came the uterus and vagina. The laceration was then distinctly seen, and the whole of the os uteri swollen and tumid; this was easily returned; the patient was, as might be expected, much exhausted; a stimulant and dose of opium were given, and she was allowed to rest.

November 16th. A good deal exhausted and very sore. Countenance good; tongue moist; pulse 80, soft; no fever. Passed her water twice, and had two motions; no swelling or tenderness in the abdomen; she is in good spirits; she sat up when her bowels were relieved; the uterus then came down and remains down now; the laceration and the abrasions on the anterior lip can be seen. I returned the uterus, and desired that

it might be returned as often as it came down, and supported by a perineal bandage, first, however, fomenting it well.

17th. Some diarrhœa and pain in the uterus, but no distension or general hardness of the abdomen; for this, a poultice, and some grey powder, with Dover's powder, was given; and under this treatment these symptoms gradually subsided.

On the 27th, "the pain and tenderness in the abdomen have quite subsided, and her health is much improved." To-day she told me that she was much neglected in her first confinement, and has had prolapsus ever since. About a year since she had retroversion of the uterus, followed by a miscarriage at the fourth month; since this time her uterus has descended daily, and has *prolapsed every day during her pregnancy, even to the day of her delivery, when it had been down to a considerable extent, forming a large tumour externally.* At times she has had considerable discharge from it, and was aware of ulceration existing round the os. It has frequently been down as large as her two fists; and although she has been a great sufferer during her pregnancy, she has not consulted any medical man about it, but allowed it to progress without interference.

On the 29th November she had a severe rigor, followed by well-marked symptoms of inflammation of the pelvic fascia, threatening suppuration; this, however, was averted. On Christmas Day she sat up for the first time, her health being good, and her spirits excellent. The prolapsus returns whenever she sits up, but the uterus is easily restored to its proper place when she lies down. The patient continues to suffer from prolapsus in an extreme degree, and the best devised means I have been able to suggest have failed to support the uterus in its proper place. Her health now (February 24) is good, but she suffers much from the irritation the prolapsed organ causes.

[These cases are happily of rare occurrence. Dr. Merriman, in a short paper in the 'Medical Times,' gives some account of six cases collected from various sources. Dr. David Davies also, in his 'Principles and Practice of Obstetric Medicine,' relates six more; and Dr. Ashwell mentions two others.]

From a review of these fourteen cases we find:—

That two cases were primiparæ; four, multiparæ; in eight, the number of pregnancy was not named.

That in two cases the head presented; in twelve, the presentation was not named.

That in four cases there was great rigidity of the os; in ten, the state of the os was not mentioned.

That in thirteen the prolapsus was complete; in one, this was not mentioned.

That in one case venesection, tartar emetic, opium, remedies calculated to overcome rigidity, were used without benefit; in four, counter-pressure was used; in four dilatation; in four, the mode of proceeding does not seem clearly related; in two, incisions were practised; in one, turning.

In twelve cases the patients recovered, I presume with prolapsus uteri remaining; in one, death occurred; in one, recovery without prolapsus.

Rupture of the cervix uteri took place in one case.

The most striking fact arising from the above summary is, that out of fourteen patients who suffered from so serious an accident as prolapsus uteri during labour, thirteen recovered. Hence in these cases we have much to hope for, however serious they may seem at first.

It does not appear that the evidence before us supplies materials for deciding upon the best mode of treatment in these cases, for opinion seems to have been pretty much divided amongst the persons who conducted the cases recorded,—for four used counter-pressure; four, dilatation; four did not record their proceeding; two practised incision; one, turning. But the accounts of most of them are so meagre that we cannot attach much importance to them as guides to practice.

Counter-pressure, dilatation, and incision, are the modes of treatment which were most practised, and which seem most naturally to present themselves to the mind as the means best calculated to meet the difficulties we have to contend with, and on each of these a word may be said.

Counter-pressure, and by this I mean supporting the uterus *in situ*, seems to be applicable in all cases of prolapsus during labour. It was used in four of the cases reported,—indeed, on seeing a case this mode of treatment at once suggests itself, (at least it did so to me and to three other observers, though I had never before witnessed such a case, or contemplated the possibility of one occurring). For, on seeing the uterus and vagina protruded, and reflecting how the uterus is naturally suspended in the pelvis, it follows almost as a corollary to the mind, that by supporting the vagina by means of the points of the fingers, and thus maintaining its proper *cul de sac*, a point is afforded for the uterus to act from, from which the head of the child or the membranes, if entire, may press upon the os, and thus facilitate dilatation.

Some of these cases, however, are attended with extreme rigidity, and spontaneous dilatation may not be so easily effected, and then mechanical dilatation or incision must be decided upon.

Mechanical dilatation was performed in four of the cases,—but these four cases all occurred when mechanical views of parturition were prevalent, and long before the physiology of labour was understood. Independently of any injury which might be done to the os uteri by the act of dilatation, I think that upon physiological grounds there are strong objections to it,—for if the views promulgated by Dr. Tyler Smith be correct, and of their general truth I feel no doubt, then by the act of dilatation we should be running great risk of producing violent uterine action, by stimulating the reflex function of the uterus, and thus probably induce the greatest danger we have to fear,—viz., violent pains and laceration of the cervix or body of the uterus. Hence I should not be disposed to try dilatation were another case to come under my observation.

Incision of the cervix was practised in two cases, and both did well. During the last few years a good deal of discussion has taken place on the propriety of incising the cervix in cases of extreme rigidity of the os uteri, and names of high repute are ranked amongst its advocates—Murphy, Lever, Tyler Smith, Kennedy, &c.

Dr. Murphy observes: "After all, in making incisions we are only imitating nature, who, in her own way, often incises the cervix,—you cannot go wrong in following her example, and therefore, when you meet with these very embarrassing cases (simple rigidity), I feel justified in recommending you to incise the cervix;" and Dr. Lever considers that "the operation is free from danger or pain, or fear of hemorrhage." Dr. Smith also recommends it in extreme cases of rigidity.

Dr. Ramsbotham, in the last edition of his work, whilst arguing generally against the practice, and looking upon it in a much more serious light than Dr. Lever seems to do, would still allow it, but "only with extreme caution in unmanageable cases, and then not till all other means of procuring dilatation had failed."

But if there can be an extreme case, I conceive that such a one as that I have recorded must be ranked amongst the number; and remembering the imminence of the danger, the anxiety it creates, and the probable result of waiting too long,—laceration or rupture,—I am disposed to think that, after well weighing all the facts and the authorities I have been able to consult, if another case should occur to me, I would try counter-pressure for a time, and if then the rigidity continued in spite of the ordinary means of overcoming it, I would incise the os; and I am the more disposed to this conclusion by remembering the admitted uncertainty of all the means which have hitherto been devised for overcoming rigidity of the os uteri.—*Dublin Quarterly Journal of Med. Science, May* 1853, *p.* 308.

105.—ON PROLAPSUS OF THE ANTERIOR WALL OF THE VAGINA AS AN OCCASIONAL CAUSE OF FETID, PHOSPHATIC, MUCOUS URINE.

By Dr. Golding Bird, F.R.S., &c.

[Dr. Bird remarks that middle-aged females sometimes suffer great distress from symptoms similar to those occasioned by enlarged prostate in the male; that is to say, there is great irritability of the bladder, the urine when passed being fetid, ropy, and containing much mucus. He endeavoured to trace these symptoms to a similar cause, namely, a prevention of the complete emptying of the bladder, and the retention of a portion of urine, so as to produce in it decomposition. Such a cause, he considers, a prolapsion of the anterior wall of the vagina. He says:]

Almost the first case in which I recognised the condition to which I am alluding, occurred about eight years ago in the person of a stout, tolerably healthy-looking woman, who had been the mother of several children, and had ceased to menstruate for three or four years. She complained of great sense of distress in the lower part of the abdomen, with weight and bearing down. Walking was painful to her, and she was almost constantly tortured with a desire to empty the bladder. The urine was very offensive, and contained a large quantity of dense, ropy mucus mixed with phosphates. Suspecting the possible presence of a calculus, I introduced a catheter, but little urine escaped, and no concretion could be felt. But on examining the vagina, a large pink look-

ing sac depended from its anterior wall, and almost separated the labia. She was indeed suffering from prolapsus of the bladder into a pouch formed in the anterior vaginal wall. By keeping the bladder emptied by the daily use of the catheter, the urine soon recovered its healthy appearance, and the mucus decreased considerably. The decomposition of the secretion in this vesical pouch had evolved ammonia, which had irritated the bladder and caused a copious secretion of mucus, loaded with the earthy salts, from its lining membrane. I sent the patient to my brother, Dr. Frederick Bird, as I believed no permanent cure could be obtained while the prolapsus existed. He applied the actual cautery to the anterior wall of the vagina, and the result was most satisfactory. After the slough came away, sufficient contraction occurred to prevent the formation of the vesical pouch, and the patient remained free from the ailment which had so long distressed her. I have met with so many analogous cases, that I am persuaded of the possibility of tracing a very large proportion of cases of fetid phosphatic mucous urine in the female to the imperfect emptying of the bladder from prolapsus of the anterior vaginal wall. Every one is well aware of the frequency of enlarged prostate as a cause of this state of the urine in the male, and the circumstances to which I have now drawn attention will be found to be as frequent a cause of this state in the female. In more than one instance, I have seen complete prolapsus of the uterus produce a similar result, evidently by drawing the bladder out of its position, and thus interfering with its being perfectly emptied at the will of the patient.

So far as I have seen, the ailment in question is nearly, although not exclusively, confined to females who are called upon for laborious exertion generally too soon after their confinements; or, in other words, to those who are most subject to uterine displacements. Certainly I have met with but very few cases in the higher ranks.

Although this little communication presents no very attractive features, I do feel it deserves a moment's notice, as I have seen many poor women deprived of the means of earning their bread as domestic servants, from the apparent incurability of the ailment. A few months ago, a lady who resides in my neighbourhood, expressed to me her deep regret that she was under the necessity of discharging her cook, a really valuable and trusty servant, on account of the urinous and even fetid odour which exhaled from her person. The poor woman had been out of place for a long time before entering this lady's service, on account of this very ailment. Her kind mistress had already obtained medical advice without any relief. On the patient calling on me with her urine, I found it to be strongly alkaline, exceedingly fetid, and loaded with mucus and phosphates. She never had been married, but had suffered, as she fancied, from prolapsus of the uterus for many years. I found, that, after emptying the bladder by the catheter as completely as possible, the urine secreted and removed, in half an hour was slightly acid, and scarcely fetid. I desired her to call on me early on the following morning, before attempting to pass water; and I then discovered the labia to be separated by a large soft red body, which turned out to be the depending anterior wall of the vagina filled with her prolapsed bladder. The use of an injection of infusion of galls three times a-day

into the vagina, the wearing of an abdominal support, with a perineal pad, and the administration of iron and quina, with dilute phosphoric acid, soon restored her to health and comfort, and enabled her mistress to retain her services.

A nearly identical case occurred in the person of a favourite servant of a lady of rank, who had actually obtained for her the opinion of more than one of our most distinguished surgeons, as she was supposed to be labouring under calculus. She was ultimately completely relieved in a similar manner. But there was a curious fact connected with this case worth mentioning, and which I learned from the mistress, Lady C——. It appears that, after failing to obtain relief from legitimate sources, she had been induced to consult a "wise woman," residing in the village where her lady's country residence was situated. This sibyl told her that she laboured under "sinking of the womb," and that she could cure her. On her next visit, the woman introduced something into the vagina. The operation gave her very considerable pain, but, to her great delight, it certainly diminished the irritability of the bladder and offensive character of the urine. She retained this body for some months, when it fell out; and, on being shown me, I was rather surprised to find that it was a large smooth black siliceous pebble, so common in the beds of brooks and shallow streams. Whatever induced the old woman to make her diagnosis, her clumsy substitute for a pessary had afforded no small relief.

I would, then, in conclusion, express a hope that, whenever a female is found to labour under the annoyance and distress accompanying the excretion of fetid mucous phosphatic urine, the state of the uterus and vagina should be carefully examined when the bladder is distended, and I believe the ailment will be often cured by relieving the prolapsed state of that viscus by the means well known to every practitioner.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 11.

106.—ON INFLAMMATORY AND NON-INFLAMMATORY RUPTURES OF OVARIAN DROPSICAL CYSTS.

By Dr. J. Y. Simpson, Professor of Midwifery in the University of Edinburgh.

[From the cases and observations of Dr. Simpson on this subject, the following conclusions may be deduced.]

1. The cysts forming an ovarian dropsy, occasionally rupture, *first*, from inflammatory effusion into and distension of their cavities; or, *secondly*, (the contents of the cysts, being only the common bland secretion of such cysts, and unmixed with any inflammatory matter), they may rupture from mere over-dilatation and gradual attenuation of their coats, or under sudden mechanical pressure and injury.

2. When a cyst ruptures from the effects of inflammation, or contains within it at the time of rupture inflammatory secretions and materials, the escaping fluid, if effused into the cavity of the peritoneum, is always liable to be followed by dangerous, and generally fatal, peritonitis.

3. If, however, a cyst bursts into the peritoneum under mechanical injury, or in consequence of simple laceration from over distension of its cavity, and the fluid effused into the sac of the peritoneum is consequently not commixed with inflammatory secretion, there is little or no great tendency to peritonitis.

4. Sometimes, indeed, when thus a non-inflamed ovarian cyst ruptures into the cavity of the peritoneum, the life of the patient is preserved, or at least prolonged, by this accident.

5. When an ovarian cyst ruptures into a mucous canal, or upon the cutaneous surface, the safety or danger attendant on the laceration is not regulated by the inflamed or non-inflamed character of the effused fluid.

6. In cases in which the fluid of an ovarian cyst obtains an outlet by a mucous canal, or by the skin, a temporary or more permanent reduction of the tumour and comparative cure of it may be the consequence.

Lastly, that, as in many cases and points the surgery of art is an imitation of the surgery of nature, possibly the artificial repetition and establishment of the above modes of relief, if they could be imitated safely and certainly, may yet be found capable of temporarily arresting, if not curing, ovarian dropsies, in some appropriate cases, and more particularly in instances in which the bulk of the tumour is formed by one large preponderating cyst.—*Monthly Journal of Med. Science, Dec.* 1852, *p.* 531.

107.—*On the Position of the Patient in Tapping Ovarian Cysts.* By Dr. T. H. Tanner, Charlotte street, Bedford square.—[In the last volume of the 'Retrospect' we mentioned the plan advocated by Dr. Simpson, of Edinburgh,—that of tapping in cases of ovarian dropsy in the recumbent posture upon the edge of the bed, instead of the half sitting posture upon a couch or chair. In speaking of the advantages of this plan of Dr. Simpson's, Dr. Tanner observes]

First, it is a comfortable one, free from restraint, and one from which the patient has not afterwards to be moved; secondly, the belly-bandage, and the two assistants necessary to tighten it, in order to promote the flow of the fluid when the sitting posture is adopted, can be dispensed with; thirdly, that the cyst is more completely emptied than in the usual way; and fourthly, syncope is much less likely to occur; for as this takes place from the want of support which the diaphragm experiences, owing to the shrinking of the tumour, so this want is less felt in the recumbent posture. It is only necessary to mention, that this woman has derived great relief from the operation, is stronger than she was, and has been freed from all feeling of distension, pain, and dyspnœa. Of course this relief can only be regarded as temporary; for it is much to be feared, that not only will the sac soon refill, but that the smaller cysts will not long remain dormant.—*Lancet, Nov.* 20, 1852, *p.* 463.

108.—ON RUPTURE OF THE PERINEUM.

By J. Baker Brown, Esq.

[In a paper read before the Medical Society, this gentleman completes his experience of the treatment of this distressing accident. Mr. Brown made a series of observations upon the same subject in 1851. The operation for its relief is thus described:]

The patient should be placed in the position for lithotomy: the knees well bent back upon the abdomen by an assistant to each leg; that the parts around should be carefully cleansed of hair by shaving; then each assistant should hold the sides of the vagina and perineum, so as to insure sufficient tension for the operator to make a clean incision with a scalpel down into the vagina about three quarters of an inch on each side, removing carefully and thoroughly the mucous membrane. Having done both sides, there would still remain a space covered with mucous membrane between those two sides, embracing the edges of the rectum where the sphincter was lost; that this must also be carefully denuded, —very carefully, because, if there remained the slightest portion of mucous membrane around, or even near to the rectum, then most certainly there would be a recto-vaginal fistula after the restoration of the perineum; that some operators, especially on the continent, had removed the mucous membrane by the scissors, but Mr. Brown stated, that that was a long and insecure method, and that the knife would be found quicker and better. Mr. Brown observed, that as soon as this stage of the operation was completed, the sphincter should be divided as before described; then the legs should be relaxed, and the thighs brought more in apposition, so as to allow the sides of the vagina to be grasped with the forefinger and thumb of the left hand, while with the right the sutures were passed deeply through each side, as deep as the denuded surfaces of the vagina; the first backwards, as near the rectum as possible without piercing it; the second and third in the same way; that the length of the incision should correspond with the scar of the ruptured surfaces; that the sutures were double, so as to allow the quill, or more properly, the piece of elastic bougie, to pass through each suture on both sides. Mr. Brown preferred twine to silk for the sutures, because it was less irritating, and produced, therefore, less suppuration; that the forefinger of the right hand should then be passed into the vagina, and the forefinger of the left hand into the rectum, so as to ascertain that there was no opening; that, having secured the three sutures firmly to the bougies, it was advisable to bring the edges of the incised surfaces together by three or four interrupted sutures; that, if this step of the operation be carefully done, union of the skin would quickly take place, and materially facilitate the adhesion of the deeper surfaces. Mr. Brown observed, that it had been asserted by many accoucheurs of the highest eminence, that, if the operation be performed immediately after the accident, no good would result, as the lochia would flow in between the surfaces, and thus prevent adhesion

and union; this was the opinion entertained by Trogher, who states, in the seventh volume of the 'Vienna Journal' for 1851, among other conclusions drawn from sixteen cases, "that a favourable issue could only be expected where there was a very moderate flow of lochia"; also, "that it was impossible to protect the margins of the wound from the injurious influence of the lochia." Mr. Brown believed that these objections were removed by dividing the sphincter; if not, the inner edges of the wound would be gradually drawn apart by the action of that muscle and the lochia would penetrate; whereas, after division, those edges were perfectly passive, and steadily kept together by the sutures. Mr. Brown stated, that, for the convenience of discussion, and in order to make his paper more intelligible, he affirmed four distinct propositions, which he hoped to demonstrate by the cases which followed:—First, That the oldest and worst forms of ruptured perineum could be cured by the operation he had already described. Secondly, That the worst forms could be cured by operating immediately after the lesion. Thirdly. That the new perineum was not torn by, or prejudicial to, subsequent parturition. Fourthly, That those forms of rupture where the sphincter was not torn through, should be cured, to prevent prolapsus uteri, &c. Mr. Brown proposed to illustrate the first proposition by five cases; then the second and third propositions by three cases; and, finally, the fourth proposition by two cases. In all, ten cases, which, in addition to the two already published, would make twelve cases.

Case 1.—Mrs. D., aged 45, admitted into Victoria Ward, St. Mary's Hospital, January 30th, 1852. Seventeen years ago confined with her first child; instruments were used, and ever since has had no control over the bowel; has had five more children. Fifteen years ago an operation was performed at Exeter, but unsuccessfully, for at the end of ten days she was worse than before. On one occasion she remained seventeen hours on the night-stool, and was generally unable to leave her house. The whole of the structures between the vagina and perineum have been torn through, there being no remains of the anterior half of sphincter ani; there is very little loose integument about the margins of the rent in the perineum consequent on the former operation.

February 4.—The day before the operation, a purgative was given, and on the day following, the operation was performed in the way already described, and the patient left the hospital with a slight superficial fistulous opening from the anus to the vagina, which was treated by caustic, and the patient resumed her duties with comfort. In this case the bowels had been confined by opium eighteen days.

In all essential points, the next four cases were similar to the foregoing; in each of them the operation signally succeeded.

Case 6.—Mrs. E., aged —, a private patient, confined with her first child, which caused complete laceration of the perineum; the rent was through the superficial muscular fibres of the sphincter, but not through the deep fibres nor through the rectum. The operation was performed December 29th, and on the 5th of the following January she was convalescent.

Case 7.—Mrs. D., aged 35, a private patient; February, 1851, delivered of her first child after forty-eight hours of continued labour;

perineum continued like soaked pasteboard, and no care or attention prevented the perineum giving way entirely through the superficial fibres of the sphincter. Operation immediately performed, but the sphincter not divided. The cure, therefore, was much protracted. Aug. 27, 1852.—This patient was delivered of her second child, and under care, no fresh rupture of the perineum occurred.

Case 8.—Mrs. V., aged 29, October, 1851, first child, twenty-four hours in strong labour, the last six producing no good results; os uteri gone, the head on the perineum; the forceps had been used by the medical man in attendance, and rupture of the perineum through its whole extent, and through the superficial fibres of the sphincter, but not through the deep fibres, was the result. The operation in the manner before described was performed, with the exception of the division of the sphincter, which rendered the union much slower than it would have been; but the patient did very well, and on the 12th Nov., 1852, Mr. Brown attended the lady, and she had a good labour, and no fresh rupture ensued.

Case 9.—Elizabeth Turnage, aged 37, admitted into Boynton Ward, St. Mary's Hospital, March 26th, 1852. Three years ago, at her confinement, the perineum was completely ruptured by the sudden descent of the head without medical assistance, at the moment of its extrusion. The rupture did not go through the sphincter or recto-vaginal septum, and she had not suffered from incontinence of fæcal dejections, but much from procidentia uteri, which partially extruded from the vagina, and pressed on the rectum, producing fissure of that bowel. The fissure was first cured by division of the sphincter, and the cure of the procidentia uteri attempted by the usual remedies for the restoration of the health, but did not succeed on account of the absence of the floor of the vagina, and on April 7th, the operation for the restoration of the perineum was performed, as already explained, and on the 24th the patient was discharged cured, with a sound perineum, and free from procidentia uteri.

Case 10.—Elizabeth A., aged 23, admitted July 2nd, 1852, into Boynton Ward, St. Mary's Hospital. Had been married twelve months, confined five months ago, labour lasted three days, no instruments used. The perineum had been ruptured through its whole extent, but the rent had not passed through the sphincter. There was procidentia uteri, and discomfort about the rectum, produced by pressure of the uterus on that bowel. On the 7th the operation was performed as previously described, and on the 30th she was discharged cured.

Dr. BARNES was inclined to think that a great improvement would be effected in Mr. Brown's operation if the bead sutures, invented by his friend, Mr. Brooke, were substituted for the quill sutures. These bead sutures had been found very useful in cases of perineal laceration, and could be applied anywhere, and at any depth from the surface. Moreover, by their employment, not only the external wound, but the internal also, that is, the wound of the vaginal mucous membrane, could be brought together, and thus a large gap which favoured the formation of matter would be prevented. If this suture were employed, it would not be

found necessary to divide the sphincter; and this was, he conceived, no slight advantage to the patient. In Mr. Brown's operations, the sphincter had been divided in a manner inferior, in his (Dr. Barnes's) opinion, to the subcutaneous section practised by the late M. Blandin, of Paris, for a similar purpose.

[Dr. MURPHY, considering the obstetrical rather than the surgical division of the subject, said, there were cases of perineal laceration of a less serious nature in which the propriety of operation might be questionable.]

When the laceration had involved only the anterior fibres of the sphincter ani, and the patient still retained the power of commanding her motions, especially if the perineal space were originally of small extent, he thought it would be more prudent to abstain from closing the rent, because, at the next labour, it was highly probable that rupture would again take place. If the operation could restore to the patient a perfectly extensile natural perineum, he should not object to its performance; but this was not the case, for the cicatrix resulting from the closure of the wound was of a far less yielding nature than the original structure, and therefore was doubly susceptible of laceration. He was decidedly opposed to, and was almost induced to say he protested against, the performance of an operation in recent cases as soon as possible after the occurrence of the rupture. It was vitally important for some time after delivery to avoid the accession of inflammation in the tissues adjacent to the uterus; and if inflammation were set up in the vagina, there was great reason to dread its extension. Besides, it was well known that a laceration of the perineum, which, a few hours after delivery might appear of formidable extent, would frequently contract in two or three days to one of insignificant size, so that an operation practised prematurely might have been altogether unnecessary. For these reasons, he considered that in all cases of perineal rupture in which an operation was resolved upon, it would be infinitely better to defer the operation than to practise it immediately after parturition.

[Mr. BROWN, in conclusion, remarked that:]

Dr. Barnes had recommended him to substitute the bead suture of Mr. Brooke for the quilled suture, but it was impossible that the bead suture, however excellent it might be in vesico-vaginal fistula could succeed better than the quilled and interrupted sutures had done in his hands. Dr. Barnes mentioned, that if the bead suture were employed, division of the sphincter would be unnecessary; division of the sphincter, however, was one of the most essential features of his operation, and without its performance he should not look with any confidence for success. He had never seen any harm result from the prolonged constipation, and he believed that the opium exercised a most salutary influence over the patient, by allaying the irritability of the nervous system, and so diminishing the risk of inflammation. He preferred complete division of the sphincter with the skin covering it, to the subcutaneous section of Blandin, because it was of the highest importance to relax the integument and cellular tissue as well as to paralyse the muscular fibres. Dr.

Murphy was, he thought, needlessly apprehensive of vaginitis when the operation was performed immediately after labour; he (Mr. Brown) thought the exhibition of opium protected the patient from inflammation, and he would never, under any circumstances, resort to the operation without freely administering that narcotic. In conclusion, Mr. Brown referred to a case in which a lady, who had become reduced in circumstances, was obliged to perform the duties of a governess, having a considerable distance each day to walk to her pupils. She had suffered at one of her labours a severe laceration of the perineum, and now had large prolapsus uteri in consequence; she was obliged to wear a bandage in order to keep the uterus in position; but this was a source of great discomfort to her, and her health was failing in consequence of the condition in which she was placed. He (Mr. Brown) had advised her to submit to the operation, and he felt sure that after its performance she would be in a state of complete comfort.—*Med. Times and Gazette, Jan.* 15, 1853, *p.* 72.

109.—ON DYSMENORRHŒA.

By Dr. Jas. Henry Bennet.

[Speaking of the form of disease produced by contraction of the os internum, Dr. Bennet says:]

The cause of the pain experienced under the circumstances is evident. The cavity of the non-pregnant healthy uterus not containing more than about ten or eleven drops of fluid, as soon as the catamenial secretion commences from the lining membrane of the uterine cavity, unless the blood find a free exit through the os internum and the cavity of the cervix, it distends the uterus, and gives rise to great pain. The obstruction may merely be, at the os internum, spasmodically contracted; in which case, as soon as it has been overcome, the blood escapes freely, and pain disappears. But if the os internum is permanently contracted, or the contraction exists in the cervical canal, the pain may continue throughout the catamenial period. A contracted state of the upper part of the cervical canal, or of the os internum, is not, I believe, an unfrequent complication of inflammation of the cervix, from the swelling and hypertrophy of the substance of the organ which it occasions. This remark, however, does not apply to the *inflamed region* of the cervical canal, which is uniformly dilated by the existence of inflammation. I do not, however, think that Dr. Simpson's criterion of the existence of contraction of the os internum is entirely to be depended upon. Dr. Simpson believes, if I am right in my interpretation of his views, that unless the uterine sound pass without effort into the uterine cavity, there is contraction of the os internum. Now the careful examination of many hundred females with the sound, has led me to a different conclusion. There evidently exists at the os internum a kind of muscular sphincter, formed by a strong band of the circular muscular fibres of the cervix, and destined to close the uterus during the latter stages of pregnancy. Generally speaking, this sphincter, in the natural state, is sufficiently closed to prevent the uterine sound passing into the

cavity of the uterus, unless a considerable amount of pressure be exercised. In nearly all the females I examine, in the interval of menstruation, the sound passes easily along the cervical cavity, but stops at the os internum, and that, when there is no reason whatever to suppose the existence of a morbid coarctation.

[The above extract is taken from a review in 'The Lancet' of Dr. Bennet's recent work on 'Inflammation of the Uterus, its Cervix, and Appendages; and on its Connection with Uterine Disease.']—*Lancet, Dec.* 18, 1852, *p.* 571.

110.—*Case of Chronic Bronchitis, complicated with Dysmenorrhœa—Treatment of the latter by Biborate of Soda.* Under the care of Dr. Bennet.—[In Germany, the biborate of soda is used to produce uterine contraction, and to facilitate the excretion of lochia and the menstrual fluid. In the former case it is given along with ergot, and in the latter, alone. From the frequency of the occurrence of dysmenorrhœa, and the difficulty of its management, it is important to ascertain whether it possesses any value as a remedial agent in this disease. The following case is selected as illustrating its efficacy:]

Eliza York, aged 26, of dark complexion and florid appearance, was admitted as an out-patient Aug. 23, 1852, on account of cough, attended with some dyspnœa. She stated that she had been losing flesh slightly for several months; the respiratory sounds beneath each clavicle were somewhat harsh, but no decisive indications of pulmonary disease could be detected. It appeared, that although her cough had been the more alarming to her, yet she had in reality suffered chiefly from a very painful condition of menstruation. She had been married for two years, and, during the whole of that period, the catamenial discharges had been regular in their recurrence, lasting usually for about a week, and attended throughout with such great suffering, that she had always been compelled to observe the recumbent posture for the greater part of the time. The matters discharged were usually very dark in colour, and and mixed with clots of blood and numerous flakes of whitish membrane. In the intervals, more or less of leucorrhœa was constantly present, accompanied by a dull aching pain in the lower part of the back. Her tongue was redder than natural, covered at the tip and edges with prominent papillæ, and somewhat fissured. Pulse 96, and a little sharp. Conformably with what is mostly observed in those who suffer from aggravated dysmenorrhœa, she had never conceived. She had been subjected to a great variety of treatment, but with very little advantage, and the last menstrual period had been as painful as any of the preceding.

As it appeared probable that the pulmonary affection was either mainly or altogether sympathetic, Dr. Bennet directed his treatment solely to the uterine affection, and prescribed his usual formula of the borax, in conjunction with a mild stomachic.

℞. Magnes. carbon. gr. v., pulveris rhei gr. ii., sodæ biborat. gr. x., infus. calumb. ℥i., ter die sumend. Empl. ammon. cum hydr. lumbis applicand.

August 30.—The dose of medicine occasioning sickness, there was added to it acid. hydrocyan. dilut. ♏ii.

September 20.—The menstrual period occurred last week, and was attended by scarcely any pain. The discharge lasted for five days; it was copious, and unmixed with either shreds or flakes. During the whole time she continued at her ordinary avocations, and enjoyed a degree of comfort to which at such times she had been for years a stranger.

Pt. medicament. bis die sumend. Pt. empl.

October 18.—Has again menstruated without any material suffering. The aching sensation in the back has entirely disappeared, the chest symptoms have also all but vanished, she feels very well and is anxious to be discharged.

We are unable to discover in the above case any source of fallacy which should prevent us from attributing to the remedies the markedly good effect which followed their exhibition. In that effect, as far as the uterus is concerned, it may be safely assumed that the hydrocyanic acid had no share, not only on account of its possessing no known powers in that direction, but because the prescription, as at first ordered, which is the one usually employed by Dr. Bennet, has produced, in very numerous instances, equally pleasing effects. As the prescription contains several articles, some of our readers will perhaps doubt the fairness of attributing to one of them the whole of the results; and, from never having seen the borax exhibited alone, we cannot give a positive opinion. Our belief, however, is very strong that it alone was the effective ingredient, and we ground the belief on the fact, that various combinations into which it entered have succeeded equally well, and that in several cases its addition to a mixture which had been in use without benefit for some time at once produced the desired result.

In no class of maladies than those affecting the menstrual function is it more necessary to remember that diseases are not always the same which are called by the same name, for under the term "dysmenorrhœa" are included affections which, depending on nearly opposite causes, are curable by almost contrary remedies. In selecting the latter it is, therefore, of the utmost importance to discriminate carefully the real nature of the case. The class of cases to which the treatment by borax appears to be especially adapted are those in which no organic disease exists, but which, occurring in tolerably robust subjects, are attended by slight pyrexia, pain in the loins, the expulsion of flakes and shreds of lymph, and the other signs of a disease of active congestion rather than mere nervous derangement.

Whilst on the subject of dysmenorrhœa, we cannot help mentioning a very interesting pathological specimen lately shown to us. It consisted of a *complete fibrinous cast of the uterus*, and had been expelled by a middle-aged married woman, during an attack of extremely painful menstruation. It was about two inches long, and one in breadth at the upper part, where two slender prolongations marked the position of the Fallopian tubes. It was hollow, and had thick, tough walls, within which the thumb could be introduced with ease. Its lower part was contracted, and showed very plainly the mouldings of the os uteri: its structure was composed of greyish yellow fibrine, stained with blood.—*Med. Times and Gazette, Dec.* 4, 1852, *p.* 566.

111.—CASES OF COMPLICATED POLYPUS UTERI, WITH REMARKS.

By Dr. Francis H. Ramsbotham.

The term "polypus uteri" has been given at different times to organic diseases of the uterine structure, as well as to formations within the uterine cavity of very various and dissimilar kinds; and even now, though it is restricted to tumours attached by vascular connexion to the uterine substance, the phrase is applied to more than one variety of morbid growths. Some are dense, firm, and compact in their structure; some soft and cellular; some of a florid scarlet; some of a deep peony colour; and some, when removed, almost white. They take their origin also from different parts of the organ,—the fundus, the body, the internal channel of the neck, or the outer circle of the mouth itself.

Dr. Lee, in his essay in the nineteenth volume of the 'Medico-Chirurgical Transactions,' has noted four distinct species of polypus uteri, none of them malignant in their nature:—the fibrous;—the follicular or glandular, which he describes as a morbid enlargement of the *glandulæ Nabothi;* and which, consequently, are situated only at the mouth or neck;—the cystic or cellular, made up of a congeries of small vesicles or cysts, containing a fluid more or less transparent, and yellowish in colour. This variety is formed just beneath the lining membrane of the uterus, and springs from every part of the cavity. The tumour is highly vascular; and the cysts composing its chief bulk are bound together by fine fibrous tissue;—and, lastly, the mucous, which does not grow to so large a size as either of the others, and which seems to be produced by a morbid change in the mucous membrane itself, and to be analogous to the polypous tumours sometimes formed within the nose and other mucous cavities.

Of these the fibrous polypus is certainly the most common; and by some pathologists it is regarded as the true fleshy tubercle, specimens of which are so often met with embedded within the uterine walls, or projecting as nodules into the peritoneal cavity, or attached to the external surface of the organ by processes more or less slender, and invested by an extension of the peritoneal membrane. It is supposed, that, if these tubercles are deeply embedded within the uterine tissue, they merely increase the size of the organ, and give an irregularity to its form; but that, if they are situated nearer to the mucous membrane, they project towards the cavity, carry a layer of uterine fibres, as well as an extension of the mucous membrane, before them; and in their growth, encroaching more and more upon the cavity, assume the pear-like shape peculiar to most polypous tumours; and, finally, dilating and passing through the os uteri so that they gradually protrude into the vagina, until their chief bulk is enclosed within that canal.

Gooch, in speaking of the fibrous polypus, says, that "their internal structure in most cases exactly resembles the internal structure of the large white tubercle of the uterus, commonly called the fleshy tubercle;" while Baillie says, that "a person looking on a section of the one and the other could not distinguish between them."

In a paper by Mr. Pollock, read before the Medico-Chirurgical Society

on January 13th of last year, that gentleman stated that the records of St. George's Hospital show, that out of 39 cases of fibrous tumours of the uterus, 38 were connected with the walls of the uterus, either embedded within them or pendulous therefrom, and one was attached to the cervix uteri; that in one case two tumours projected into the cavity of the peritoneum, and, being only connected to the uterus by thin, long pedicles, were readily moved in the abdominal cavity; while eleven projected into the cavity of the uterus. In six of these latter the tumour was single; one was very large and without a pedicle, and three were pendulous. In five of the cases where the projection was internally, there was more than one tumour, the others being embedded in the uterine substance; and two of them, having protruded through the os uteri into the vagina, were extensively ulcerated. All these eleven tumours would be classed under the generic term of polypus; and, whether we consider every fibrous polypus a variety of, and identical with, the fleshy tubercle or not, this table, as well as other observations, proves that the true fleshy tubercles of the uterus do actually not unfrequently protrude internally, as well as on the outer surface, appearing even as a tumour in the vagina; that sometimes they are connected by a narrow neck to the uterine structure; and that at others they merely bulge as it were inwards, carrying the mucous membrane which lines the uterus before them, a great portion of their substance continuing still embedded within the uterine parietes. Under either of these circumstances ulceration is liable to take place in their investing membrane, hemorrhage to occur, and indeed all the symptoms that usually accompany polypus may be developed in succession. If they are attached by a pedicle they form one species of polypus, and may be removed by the same means that would avail us in the treatment of that disease; if their base is broader and deeply seated in the uterine walls, they are not so much under command; and it is most likely that in time they will destroy life by giving rise to hemorrhage and other debilitating drains. —*Med. Times and Gazette, Jan.* 22, 1853, *p.* 86.

112.—*On the Ligature in Poylpus Uteri.* By Dr. Francis H. Ramsbotham.—[In all the cases in which Dr. Ramsbotham has operated, it has been with the straight double canula, commonly known as "Dr. Gooch's polypus canula." He has generally used whipcord as a ligature. He at first used that peculiar kind of silk called "dentist's twist,' but found that it stretched, and so used the former in preference. On the continent the knife is preferred to the ligature; and Dr. Simpson states that he always uses a curved knife. With regard to the application of the ligature, Dr. Ramsbotham remarks:]

The only danger in applying the ligature is the possibility of including within its grasp either the neck of the uterus or some of the healthy structure of that organ, near to where the polypus arises. The latter mischance, indeed, might easily occur, if that part of the uterus which gives origin to the tumour were drawn down, indented, and partially inverted, as sometimes happens when the attachment is towards the fundus. This may be obviated by surrounding the tumour at some

distance below its attachment; for it fortunately happens that that portion of the stem left in connexion with the uterine structure will decay and wither, and come away in shreds, or will be absorbed, after the separation of the chief bulk of the mass has taken place. The sensation of pain experienced by the woman on tightening the string will be our best guide to determine whether we have embraced any part of the uterus itself; if she complains much, suspicion should be awakened, the noose relaxed, and again drawn tight over a lower portion of the neck or body of the tumour. We shall run no risk of including the cervix uteri, if we are careful to carry the points of the instrument within the mouth of the womb, provided it be necessary to pass them up so high. —*Med. Times and Gazette, Dec.* 4, 1852, *p.* 562.

113.—*On the Uterine Mucous Membrane.*—KILIAN maintains the existence of a mucous membrane in the human uterus; it is more developed in the adult than in the young, and has a very considerable thickness; it posesses utricular glands, and is clothed with an epithelium, which, in the neck and the neighbourhood of the vaginal orifice, is furnished with vibratile cells. He is further of opinion, that the ciliated epithelium exists in the body of the uterus also, of which he has assured himself by examination of the uterine membrane in a rabbit, after the commencement of gestation. (It is not stated distinctly that cilia were observed in the human uterus.)

The augmentation in volume of the gravid uterus depends on the increase and multiplication of its elements. It is composed of fibres of of gelatinous appearance, lightly striated in the longitudinal direction, often granular, and strongly adherent to each other, with distinct nuclei. These fibres grow during the entire period of gestation, the nucleus finally becoming changed into a fibrous filament. The division of the fibres into fine parallel fibrils, as described by Henle, this author thinks the result of preparation. Kilian recognises two such muscular layers. He has also described papillæ on the neck of the uterus. In studying the changes in the uterus after expulsion of the fœtus, he has observed the muscular fibres less coherent, filled with fatty granules, and remarkable for the extreme paleness of their nuclei.—*Brit. and For. Medico-Chirurgical Review, April*, 1853, *p.* 545.

114.—*Apparatus for Premature Infants.*—DR. CHANNING, in an account he is publishing of his visits to various European Hospitals, describes an apparatus he saw in use at the Maternité of St. Petersburgh, the use of which might be advantageously extended. "It was a species of cradle, without rockers, into which infants are placed when prematurely born, or when imperfectly developed, and for whom a steadier and higher temperature is required than that of the atmosphere. It is made of brass, and is everywhere double; a space being left between the two plates comprising it, with openings, into which warm water may be poured, and others for drawing it off when cool. A soft bed, and a properly arranged canopy, when needed, complete the apparatus."—*Boston Med. Journ.—Brit. and For. Med.-Chir. Review, April* 1853, *p.* 566.

115.—TREATMENT OF CHRONIC ABSCESS OF THE BREAST AND MILK FISTULÆ.—EMPLOYMENT OF IODINE INJECTIONS.

Under the care of JOHN BIRKETT, Esq., at Guy's Hospital.

[It is well known, that, as a result of neglected milk abscess, the breast becomes affected with solid œdema, and that the sinuses usually running in several directions through and behind the gland, are most difficult to close.]

The remedies usually employed, are, as it is well known, support to the part, and the laying open freely of the sinuses, or the injection of them with various irritating fluids. Mr. Birkett's treatment consists in the employment of iodine taken internally, applied as an ointment over the tumour, and used also as an injection for the sinuses, whilst at the same time the part is carefully supported and subjected to gentle pressure by means of a bandage. The power of iodine, as a means of exciting the absorption of inflammatory products is well known; and, as an application to the lining membrane of sinous abscesses, it has for some time been employed on the continent, and, less generally, in this country also. The success which has attended Mr. Birkett's method of treatment has been, as the following case will show, most encouraging.

Elizabeth Wiles, aged 26, the wife of a farm labourer, was admitted January 6th, 1853. Three years ago, while suckling, she suffered what from her description would appear to have been an attack of acute inflammation, both of the left mammary gland, and of the surrounding structures. Her child was then eleven months old, and the disease appeared to have been excited by inflammation of the lymphatics of the arm from a sore on the finger. It was so severe as to confine her to bed for ten weeks, and to necessitate the employment of great numbers of leeches. It ultimately subsided considerably without having occasioned any abscess. The swelling, however, never quite disappeared, but after a time it again began to increase; and, a year subsequent to the first attack, a large chronic abscess had to be opened, which never afterwards healed. In September, 1852, she was again confined. The disease of the breast having resisted the persevering treatment of several practitioners in the town where she lived, and her constitutional powers being evidently very much reduced by the long-continued and profuse discharge of pus which it produced, she was ultimately recommended to come up to town, in order to have Mr. Birkett's opinion as to the propriety of excision. On admission, she was emaciated, and of a somewhat hectic appearance; the discharge from the sinuses was very profuse, and the whole breast much indurated. She was then suckling with the right breast.

Mr. Birkett advised her to wean her infant, and ordered her to be confined to bed, with a poultice over the part for a few days, until the state of excessive irritation which appeared to exist had somewhat subsided. He then prescribed for her the following mixture:—

℞. Potassii iodidi gr. iij., infus. gen., ℥j., ter die sumend.

The breast to be wrapped in lint spread with ung. plumb. iod.; and the whole supported by a bandage carried round the shoulder. On the 23rd, the symptoms having already begun to amend, the injection of all

the sinuses with the tincture of iodine (London Pharmacopœia) was performed by means of a tube carried to the end of the sinus. The treatment as above was persevered in, and after the expiration of a week the injection was repeated, and again after another space of two weeks. At present, March 15, the sinuses are quite healed; the gland has been reduced very nearly to its natural size, and the patient has gained in general health to a point beyond what she has enjoyed since the commencement of the disease. With the exception of the first few days, she has been allowed to be out of bed the whole time, and full diet has been allowed her. On each occasion that the injection was used, it produced considerable smarting pain, and was followed by a temporary increase of swelling and discharge, which very quickly subsided.

We scarcely need point out the advantages of the above plan of treatment over the old method of laying open the sinuses. In the latter the incisions have to extend wide and deep, and they involve considerable hemorrhage, and for a time increased constitutional irritation and great discharge of pus. Other cases of a similar nature lately under Mr. Birkett's charge, in which the iodine cure has been practised, were the result of common milk abscess, from which the above, as will be seen, differs in some particulars.

Prevention *is* better than cure, and, as we believe there are few diseases more thoroughly within the reach of prophylactic measures, than is milk abscess, we cannot dismiss the subject without saying a few words on that head. The history of this disease is in most cases easily told. A woman of delicate skin is confined, perhaps for the first time; lactation commences, the cuticular investment of the nipple, irritated by the mouth of the child, becomes cracked and fissured, each application of the infant to the breast occasions torment to the mother, and she avoids it as much as possible. The child is allowed to suck only on the sound side, the milk accumulates in the other breast, and slight inflammation is set up, to be aggravated by the increasing dread on the part of the patient of the natural method of relief, the evacuation of the milk. An abscess is the result. Now, how was all this to be avoided? In most cases pregnant women consult their medical advisers on sundry little points some time before their confinements. Let him on those occasions inquire as to the state of the nipple; and should the skin be found to be delicate, the daily application to the part of an alum wash, decoction of oak bark, or some other astringent, should be recommended. By such means the skin may be hardened, tanned in fact, and rendered just as capable of resisting irritation as that of the finger. In other cases milk abscess depends on the non-development of the nipple. The surgeon should take care that a shield be provided beforehand, and that his patient knows how to use it properly.

But, supposing that, with the greatest care, abscess has proved unavoidable, there are still measures by which the disease may be prevented from passing into the deplorable condition in which we have noted that the patient in the above case came into Mr. Birkett's hands. We have repeatedly heard Mr. Paget observe, that, among his out-patients at St. Bartholomew's, he never has any opportunity for trying the various vaunted injections for the cure of sinuses in the breast, because the latter

always heal of themselves. We have very carefully watched Mr. Paget's practice, in which mammary abscesses are very common, and can most fully confirm this statement. His treatment consists in the free evacuation of all collections of matter, and in the internal exhibition of tonics. A generous diet of meat and beer, with full doses of quinine or iron,—such are the remedies under which improvement in the local and general condition of the patient seldom fails to become rapidly manifest. It must, however, be admitted that the applicants, as out-patients, do not include a small class of peracute cases in which the symptoms are often too severe to allow of the patient's leaving her bed. The systematic avoidance of antiphlogistic measures in the treatment of local suppurative inflammations is daily becoming more and more common, and in no respect has modern practice more strikingly advanced than in this. It affords, too, a good illustration of the application of minute pathological research to actual every-day practice. Those of our readers who had the good fortune to hear Mr. Paget's lectures on inflammation, delivered before the College of Surgeons three years ago, will remember how unwillingly the Professor admitted the existence of any increase in formative power in that condition. This view, founded as it was on theoretic reasoning, and microscopic observation of the process, has since been advocated by other pathologists, including some of the German school, and it is interesting to observe how, upon empirical recommendations merely, the line of practice which it would suggest is rapidly coming into vogue.—*Med. Times and Gazette, April* 2, 1853, *p.* 347.

116.—PERFORMANCE OF TRACHEOTOMY IN A CASE OF UTERINE EPILEPSY.

Under the care of Dr. Tyler Smith.

[Dr. Marshall Hall's investigations have rendered the treatment of epileptic seizures by tracheotomy sufficiently public; *laryngismus* being one of the symptoms especially calling for relief. In the following case of Dr. Tyler Smith's, the attack originated from derangement of the uterine function.]

Sarah B——, the wife of a gamekeeper, at Debden, in Essex, was admitted into this hospital, on the 13th of Jan., 1853. The patient has had four children, and has been the subject of epilepsy of the most severe character, from the appearance of puberty. At this time she acted as nurse to a child who suffered severely from fits, and it was supposed that this circumstance had some influence in causing the first fits which occurred to the present patient. For some years the fits occurred with great regularity at each catamenial period, as many as twenty seizures frequently occurring before and during the menstrual flow. Of late she has menstruated scantily and at irregular intervals, but the fits have pretty generally attended the periodical discharge. The attacks of convulsion were preceded by screaming, after which she would be violently thrown down, and the respiration so arrested by laryngismus, as to produce frightful lividity of the head and face. This

poor woman had been reduced, by the long continuance of her malady, to such a state of fatuity as to be quite unable to attend to her domestic affairs, and, in several instances, violent mania had followed and preceded the seizures. On two occasions she has been confined as a lunatic. Her head and face bear the marks of many wounds produced by falls at the onset of fits. In 1850, she suddenly fell in a fit across a bed in which her child, an infant of seventeen months old, was laid, and killed it on the spot. Her husband was absent half an hour, and when he returned found his wife nearly insensible by the side of the dead infant.

There could be no question, therefore, that this was one of the gravest instances which could occur of this terrible disease. The patient was not considered a fit subject for permanent abode in an asylum, but in her own cottage she was a source of constant danger to herself or others. We proceed to give a detail of her case from the date of her admission to the present time.

Jan. 19th, or sixth day after admission.—The catamenia were present, and she had one fit, but not of a very severe character.

Twelfth and thirteenth days.—After the catamenia had ceased, she had a fit each day. These fits were severe, and she was thrown violently to the ground, but they were not of long duration. She had a fourth fit eight days afterwards, and on the following she had two others. Single fits followed on every third day after this, so that during the month which she passed in the hospital before the operation, nine seizures occurred.

After the patient had passed one month in the hospital, Feb. 13th, tracheotomy was performed by Mr. Lane. An instrument was used on this occasion, contrived by Mr. Thompson, late of University College, which opens the trachea by a double lancet, piercing the tube horizontally between the tracheal rings. In ordinary cases this instrument would have the advantage of opening the trachea by one incision, without dividing the rings, but in this case the integuments were first divided, as the woman suffered from an enlarged thyroid gland. The puncture of the windpipe immediately produced tracheal cough, and whistling respiration began at once through the aperture. Very little blood was lost, and that which passed down the trachea was readily coughed out through the tube. Chloroform was used, and during the early part of the anæsthesia the limbs were rigid and convulsed, but the spasm passed away after the puncture of the trachea, and she did not have a perfect fit. The patient was now placed in a warm situation in her ward, and a gauze cravat put round her neck. No inflammation of the trachea, or other ill consequence followed upon the operation.

Two days after the opening of the windpipe she became restless and disturbed in the night. Heat of skin, raised pulse, and furred tongue were present on the next day, and she was very unruly. In the evening she threw the medicine-glass at the sister of the ward. Dr. Tyler Smith prescribed a febrifuge and an active aperient, and on the subsequent evening the catamenia appeared. During the two whole days previously, she had been so incoherent as to require constant watching. On several occasions she pulled the inner tube out of its place; but during this time she had nothing like a fully-formed convulsion. After

the appearance of the catamenia, the cerebral disturbance subsided, and she has since remained collected and rational. The last fit was that which occurred the day before the operation.—*Lancet, March* 5, 1853, *p.* 224.

117.—NEW GALVANIC BATTERY.

By Mr. Stringfellow.

[The inventor exhibited this galvanic battery before the members of the Royal Medical and Chirurgical Society.]

One of the chief merits of this instrument is its compactness and portability, being contained in a morocco case not larger than a lady's card-case. It is a flat plate, composed of zinc and copper in a manner somewhat similar to Pulvermacher's galvanic chains. The battery is formed by a number of compound bars or plates arranged in a series, and its strength may be graduated by the number of bars. Twenty-two bars thus arranged will communicate a decided shock, and develope an unintermitting galvanic current, by the continued application of which cauterization of the skin may be effected. Six bars furnish a current sufficiently powerful to decompose water, as may be seen by placing the conducting wires of the battery in communication with those of a decomposing bottle filled with water. Mr. Wood, of St. Bartholomew's Hospital, has ingeniously applied this decomposing power of the instrument to discover the presence of albumen in urine, and it constitutes a very beautiful and ready means of detecting it, even in highly acid urine, or in urine where the presence of a large quantity of urate of ammonia causes a precipitate of a non-albuminous character to be thrown down by nitric acid. The galvanic current evolved affords, moreover, an unintermittent stimulus, and this quality renders it available for physiological experiments, by which the properties of nerve or muscular fibres are submitted to investigation. Pocket batteries may be constructed of sufficient power to restore suspended animation, whether resulting from asphyxia or other causes, and we think Mr. Stringfellow's battery will be found a valuable and convenient instrument, both for therapeutical and chemical purposes in medicine.—*Lancet, March* 5, 1853, *p.* 233.

118.—ON FIBRO-PLASTIC TUMOURS.

By M. Lebert.

M. Lebert, the author of the well-known work on Cancer, lately read a paper before the Surgical Society of Paris, on Fibro-plastic Tumours. The principal facts and conclusions brought forward by M. Lebert are the following:—

1. Fibro-plastic tumours are composed of a cellular texture of new formation, similar to that seen in embryonic life. Fibro-plastic tissue may have an inflammatory origin, it may be the result of hypertrophy, or arise quite spontaneously.

2. Fibro-plastic tumours are made up of a soft lobulated tissue, of a pinkish yellow; or else of a firmer texture, of a pale hue; and more homogeneous; or, finally, of a mixture of a gelatiniform substance with the two structures just mentioned. These tumours are situated in the skin, or the subcutaneous areolar tissue; they may be buried in the depth of the muscular masses of a limb, especially the thigh; or else they may spring up in bone, a favourite seat being the jaws; or finally, they may grow upon the meninges.

3. Fibro-plastic tumours present the same characters in man and in domestic animals.

4. The fibro-plastic texture, which owes its origin to inflammation, has a marked tendency to fibrous transformation; it is often met with in protracted inflammations, of which it is at the same time the support and the produce.

5. Fibro-plastic tumours present either a smooth or lobulated surface, and are either globular or flattened, according to their seat, and in cases of hypertrophy they assume the shape of the affected organ. They are generally free and well-defined, but when springing from bone they are sessile, and look like excrescences.

6. These tumours may become very large, both in glandular organs and when seated on limbs, especially when they contain much gelatiniform tissue. They are generally surrounded by a fibro-cellular envelope. When a section is made in a recent case the liquid obtained is clear and transparent; but it is sometimes thick and dull, when flocculi or entire lobuli are suspended in it. Besides the textures above mentioned, there is sometimes found in the tumours a substance of a pale yellow, and quite dull; sometimes calcareous concretions are found, or else osseous radiations, when the disease begun in the periosteum.

7. Under the microscope, cells with small, rounded, or ovoid nuclei are seen, and all the forms intermediate between the cell and common fibre, especially a great many narrow fusiform bodies; the nucleoli are always very small. There are also perceived original cells with compound nuclei rolled up together, and sometimes fusiform nuclei which then constitute fibro-plastic masses.

8. As regards neighbouring textures, fibro-plastic tumours grow like fibrous tumours, as they press upon these textures without taking their place; whilst cancerous tumours substitute themselves in neighbouring parts. Fibro-plastic tumours follow, as to their growth, the following development:—There is first a local deposit; the increase is then slow, but soon becomes rapid; phlegmasia takes place; then come hemorrhage, partial calcification, softening, the formation of cysts, partial ossification, ulceration, and then, in exceptional cases, sloughing.

9. Both sexes are obnoxious to these tumours; they are seen at all ages; but they arise more frequently between thirty-five and fifty years.

10. Recurrence after operation takes place, especially in autogeneous tumours, and has not been observed in fibro-plastic hypertrophy; recurrence is not observed, as in cancer, to arise in distant organs, though it is often caused by an incomplete operation. Notwithstanding the occasional pertinacity of fibro-plastic tumours to recur in the cicatrix, they are not found to injure the general health. In very rare cases a

kind of fibro-plastic diathesis becomes established; this fact has however, been observed with fibrous, adipose, neuromatous, and melanotic tumours.

11. Singleness and a strictly local nature have been observed as a rule in fibro-plastic tumours. This fact is proved by twenty-six carefully conducted autopsies of cases in which the disease had reached its natural termination, and also by a considerable number of perfect and permanent cures after operation; whilst no such cures are known to exist respecting true cancer.

12. Fibro-plastic tumours have a much more chronic character than cancerous tumours; and save a few cases of very rapid growth, it may be said that fibro-plastic tumours, when they become fatal, last rather more than between five and ten years; whilst the natural duration of cancer is from two to two years and a half. Cases have even been known, and are not rare, in which fibro-plastic tumours have lasted twenty years and more, without much inconvenience. It should, however, be mentioned that these tumours, after a very slow progress, have rapidly assumed a very serious character.

13. Pain is very rarely acute and permanent, and is mostly, as in other tumours, of a neuralgic kind. Functional disturbance depends principally on the seat of the tumour. The general health, in the great majority of cases, remains undisturbed, except in the very rare cases of general fibro-plastic infection, or those in which the local affection has ended in extensive ulceration.

14. The prognosis of fibro-plastic tumours is much more favourable than that of cancer. Curability is the rule. The fibro-plastic texture of inflammatory origin is the more likely to be benign the more it shows a tendency to assume a fibrous character. The prognosis is, in fibro-plastic hypertrophy, likewise favourable. In fact, these tumours constitute a local affection little or not at all likely to recur, which can only become dangerous in so far as its seat, extent, or amount of ulceration are concerned. Kelis is likewise an affection of a simple kind, notwithstanding its pertinacity regarding recurrence in the cicatrix after operation. Fibro-plastic tumours of spontaneous origin are very likely to recur after excision, when they are situated on the tegumentary surface, under the skin, or in the bones. The surgeon should always bear in mind the possibility of general infection, only, however, as an occasional occurrence, but not as a probability. Fibro-plastic tumours seated in the meninges destroy the patient by interfering with the functions of the brain, though remaining all the while a perfectly local affection.

15. The treatment of these tumours should begin with the prolonged use of preparations of iodine, when the origin is of a syphilitic nature, or when the tumour is simply owing to hypertrophy. When an operation is necessary, it should consist, as a rule, of complete extirpation; strong caustics should be tried with superficial tumours of small dimension. Operations in such cases should always be performed boldly, whether the knife be carried into soft parts, or whether the affection be seated in bone. Amputation should be performed when the tumour is situated in the depth of the limb and the former sends prolongations into parts where dissection is difficult.

Autoplasty should be used to substitute healthy tissue to cicatrices likely to favour recurrence, in operations of a modern extent, and the tumour is seated on the surface. The actual cautery is necessary when superficial tumours are too extensive to admit of autoplasty.

It is finally advisable to use iodine *after* operations. as a prophylactic means against recurrence or general infection.—*Lancet, Feb.* 26, 1853, *p.* 203.

119.—ON THE COMPOSITION OF HUMAN MILK IN HEALTH AND DISEASE.

By MM. Vernois and A. Becquerel.

Looking at the contradictory reports of various analyses of milk, MM. Vernois and A. Becquerel have entered into an elaborate investigation of the entire subject. They have especially chosen 89 uniform and complete analyses to deduce certain deductions from. The following is their account of the composition of this fluid:—

	In Health.	In Acute Disease.	In Chronic Disease.
Water	889·08	884·91	885·50
Solid parts	110·92	115·09	114·50
Sugar	43·64	33·10	43·37
Caseum and extractive	39·24	50·40	37·66
Butter	26·66	29·86	32·57
Salts (by incineration)	1·38	1·73	1·50
Density.....	1032·67	1031·20	1031·47

There are more solid parts in the milk of nurses aged from 15 to 20, than in those of from 35 to 40. The quantity of butter is notably increased during the colostral period. Gestation does not induce alteration in the composition of the milk at first, but at a later period it increases the proportion of solid parts. Menstruation diminishes the density, the weight of the water and of the sugar. It increases the weight of the solid portions, especially the caseum. Insufficient aliment renders the milk too watery, the effect falling especially on the butter and caseum. An excess of butter or caseum always accompanies an ill state of health of the nursling. There are certain women whose milk, independently of any special cause, always contains an excess of butter or caseum.

In both acute and chronic disease the water diminishes and the solid parts increase; but there the analogy between these two classes ceases. In acute disease, the sugar considerably diminishes, while the three other elements are increased, the caseum alone nearly repairing what is lost by the sugar. In chronic disease, the butter and salts are increased, the sugar remains stationary, and the caseum diminishes. Thus, in acute diseases, we have loss on a respiratory element, and excess in a nutritive element; and in the chronic, loss on the nutritive element, and increase of the respiratory element. In phthisis, without diarrhœa or emaciation, there is little sensible modification; but these being present, there is considerable diminution in the weight of butter. In syphilis the density is extraordinary raised; the butter diminishes, and the salts disproportionately increase.—*Gazette Médicale,* 1853, No. 5.—*Brit. and For. Medico-Chirurgical Review, April,* 1853, *p.* 558.

120.—ON THE PATHOLOGY AND TREATMENT OF LEUCORRHŒA, BASED UPON THE MICROSCOPICAL ANATOMY OF THE OS AND CERVIX UTERI.

By Dr. Tyler Smith, Physician-Accoucheur to St. Mary's Hospital.

[Dr. Tyler Smith first thanks, in his memoir on this subject, Dr. A. Hassall for his valuable assistance, without which, he says, he could not have prosecuted his researches.]

The mucous membrane of the os and cervix uteri, like the mucous membrane of other parts, consisted of epithelium, primary or basement membrane, and fibrous tissue, blood-vessels and nerves. But as there were some special characteristics pertaining to this tissue, he proposed, for the convenience of description, to examine, first, the mucous membrane of the os uteri and external portion of the cervix; and, secondly, the mucous lining of the cervical cavity or canal. The epithelial layer of the former of these situations was tesselated or squamous, and so arranged as to form a membrane of some thickness: by maceration, it could be easily detached, and it was then found closely to resemble the epithelial covering of the vagina, with which it was continuous. Beneath this epithelial layer was the basement membrane, covering numerous villi or papillæ, which studded the whole surface. Each villus contained a looped blood-vessel, which, passing to the end of the villus, returned to its base, and inosculated with other blood-vessels of the contiguous villi. These villi had been mistaken for mucous follicles, usually described as covering the surface of the os uteri; but the microscope failed to discover any distinct follicular structure in this situation. When a thin section of the surface of the os uteri was examined by a low power, the points of the villi could be seen as dark spots through the epithelial layer. A careful examination exhibited these spots as slightly depressed in the centre, yet nevertheless slightly elevated in their margins, nipple-shaped, and containing red points, which were the terminations of the looped blood-vessels. These appearances were produced by the villi being obscured by their epithelial covering. The thick layer of scaly epithelium, and the villi with their looped vessels, were the principal anatomical features of the mucous membrane of the os and external part of the cervix uteri; and these structures played an important part in the pathological changes which occurred in the lower segment of the uterus in leucorrhœa. Between the margin of the lips of the os uteri and the commencement of the penniform rugæ, within the precincts of the cervical canal, a small tract of smooth surface was usually found, which to the naked eye seemed of more delicate structure than the neighbouring parts, and when examined by the microscope was found to be composed of cylinder epithelium, arranged after the manner of the epithelium covering the villi of the intestinal canal. The cylinder epithelium covered in this situation villi two or three times larger than the villi upon the surface of the os uteri—so large, indeed, as to be visible to the naked eye when viewed by transmitted light. Within the cavity of the cervix uteri, the mucous membrane contained four columns of rugæ, or folds, arranged in an oblique, curved, or transverse direction; and between these columns were four longitudinal grooves. The two sulci in

the median line, anteriorly and posteriorly, were the most distinct; and of these, the sulcus of the posterior columns was the most strongly marked. In the normal state, the transverse rugæ, with the fossæ between them, were filled with viscid, semi-transparent mucus; and when this was brushed away, a reticulated appearance, caused by numerous secondary rugæ, was visible. The author gave a very minute description of these four rugous columns, and the furrows between them, which was illustrated by some very beautiful drawings of the cervical canal, displaying the rugous columns and fossæ of the natural size, and magnified nine and eighteen diameters. The latter power showed a large number of mucous fossæ and follicles, crowding the depressions between the rugæ, and the rugous elevations also. The author mentioned that a healthy virgin cervix, of normal size, contained at least ten thousand mucous follicles. This anatomical arrangement secured a vast extent of superficial surface, which was still further increased by the presence of villi similar to those found in the lower part of the cervix: they were found in considerable numbers on the large rugæ and other parts of the mucous membrane in this situation. By this disposal of the mucous membrane of the canal of the cervix, a very large extent of glandular surface was obtained for the purposes of secretion. In effect, the cervix was an open gland; and in the opinion of the author, it was in this part of the utero-vaginal tract that the principal seat of leucorrhœa would be found to exist. There was an analogy here which should not be lost sight of, bearing, as it did, on the pathology and treatment of leucorrhœa, which was, the great similarity which existed between the skin and the mucous membrane of the vagina and the external part of the os and cervix uteri. The resemblance in these situations, was certainly much nearer to the cutaneous structure than to the mucous membrane of more internal parts. These analogies were strongly confirmed by what was observed of the pathological conditions to which these parts were liable, and by the effect of therapeutical applications. The author dwelt on the fact that the epithelium of the os uteri and external portion of the cervix was constantly squamous, and that the epithelium immediately within within the os uteri was cylindrical but not ciliated, but that in the rugous portion of the cervical canal the cylindrical epithelium became ciliated. The mucus secreted by the glandular portion of the cervix was alkaline, viscid, and transparent; it adhered to the crypts and rugæ, so as to fill the canal of the cervix. It consisted chiefly of mucus-corpuscles, oil-globules, and occasionally dentated epithelium, all entangled in a thick, tenacious plasma; it was remarkable for its tenacity; while the mucus found in the lowest part of the canal was thinner in appearance. There was an essential chemical difference between the vaginal mucus and the secretion of the interior of the canal of the cervix; the first was always acid, and the latter invariably alkaline. Mr. Whitehead, of Manchester, had noticed this fact, and the observations of the author confirmed his views. The acid of the vaginal secretion was more than sufficient to neutralize the alkaline secretion of the cervix, and when any secretion from the cervical canal entered the vagina it became curdled from the coagulation of its albumen. It was worthy of note, that that part of the mucous membrane of the

uterus and vagina which resembled the skin was the only part which, like the skin, furnished an acid secretion. The vaginal mucus was a simple lubricatory fluid. But the uterine cervical mucus had other uses besides that of lubrication; in the healthy condition, in the intervals of the catamenia, it blocked up the passage from the vagina to the fundus; it thus defended the cavity of the uterus from external agencies, and from its alkaline character afforded a suitable medium for the passage of spermatozoa into the uterus. Having stated his views of the structure of the utero-vaginal mucous membrane, the author expressed his opinion that the glandular portion of the cervix uteri was the chief source of the discharge in leucorrhœa. Leucorrhœa, in its most simple and uncomplicated form, was the result of an increased activity of the glandular portion of the cervix. A follicular organ, which should only take an active condition at certain intervals, became constantly engaged in secretion. Instead of the discharge of the plug of mucus at the catamenial period, an incessant discharge was set up. At first the discharge was but an unusual quantity of the elements of the healthy mucus of the cervix. The quantity increases, and becomes a serious drain to the constitution, and the glandular cervix in some cases becomes so excitable, that any unusual stimulus, even mental emotions, provokes an augmentation. The author next referred to the conditions under which the epithelium of the os and external part of the cervix uteri and upper portion of the vagina might be partially or entirely removed. The mucous membrane then presented an intensely red colour, from the presence of the naked villi, and an appearance of roughness or excoriation presented itself. He thought that among the causes which produced this aspect of ulceration were eruptive disorders, similar to herpes or eczema, which strongly marked the analogy between this tract of mucous surface and the skin. He had observed cases in which an occasional herpetic eruption upon the os uteri always produced herpes præputialis in the husband. But the most frequent cause of denudation arose from the alkaline mucous discharge of the cervix irritating the acid surface of the os uteri, and causing the rapid shedding of the epithelium round the margin of the os. A microscopical examination was given of the various discharges met with in these affections, in making which the author was assisted by Dr. Handfield Jones and Dr. Hassall. In cervical leucorrhœa, the discharge consisted of quantities of mucus-corpuscles, and in severe cases pus-corpuscles and blood-discs, with fatty matter, involved in a transparent plasma. The epithelial debris is constantly present, but in limited quantity. In vaginal leucorrhœa, including the secretions of the external portion of the os and cervix uteri, the plasma is opaque, and contains myriads of epithelial particles in all stages of development, with pus and blood globules when the villi are affected. When a circumscribed ulcer is visible upon the os uteri to the naked eye, after death, such as occurs in eruptive affections of the os and cervix, and is examined by the microscope, with a low power, it is found to consist of a base from which the villi are entirely removed, or in which only the scattered debris of villi remain; and surrounding this base there is a fringe of enlarged villi, partially or entirely denuded of epithelium. The character of the so-called ulceration of the os uteri was detailed, and

the nature of the discharges described. The author then observed that if any division of leucorrhœa were made, two principal forms must be recognised:—

I. The *mucous* variety, separated by the follicular canal of the cervix.

II. The *epithelial* variety, in which the discharge was vaginal.

With respect to the so-called ulcerations of the os and cervix, two kinds of morbid change would be observed—

1. *Epithelial abrasion,* by far the most common, in which the epithelium alone was deficient.
2. *Villous abrasion, erosion,* or *ulceration,* in which the villi are affected by superficial ulceration.

It was to the villi, denuded of epithelium and partly eroded, that the marked forms of granular os uteri were owing. The ovules of Naboth, often referred to by writers as obstructed follicles, the author had found to be in reality an eruptive disease of the mucous membrane analogous to a cutaneous affection. In these affections of the cervix uteri it frequently happened that the cervix uteri was partially everted, and the deep-red surface covered by vascular villi thus exposed, had frequently been mistaken for breach of continuity in the mucous surface. The author then offered some remarks on the practical deductions which might be drawn from the present investigation. The glandular structure of the parts from whence the leucorrhœal discharge arose pointed to the influence of constitutional causes, and exemplified why this affection should be so common in women of strumous habit and leuco-phlegmatic temperament: it vindicated the importance of constitutional treatment, and directed attention to the more rational employment of topical remedies; and it was evident that the profuse application of caustics, as recommended by the French school of uterine pathology, was both unnecessary and unscientific. He admitted that leucorrhœa of the cervical canal was sometimes cured by the use of caustics to the os uteri, but in these cases they acted as counter-irritants to the glandular structure. The indications of treatment, based on a knowledge of the minute anatomy of the os and cervix uteri, and the study of its pathology in leucorrhœa, appeared to the author to require constitutional medicines and regimen, with local applications. Local measures, to be of any use in cervical leucorrhœa, should be applied, not to the vagina, nor the os uteri, but to the canal of the cervix. In vaginal or epithelial leucorrhœa, common injections were serviceable; but in cervical or mucous leucorrhœa no benefit could result unless the injection passed into the cervix. He mentioned the methods he adopted to secure this result, and concluded by expressing a hope that the prosecution of these researches might prove serviceable, by rendering a troublesome class of maladies more intelligible than they had hitherto been, and by tending to correct errors of practice, and to indicate the just value of constitutional and topical remedies.

[Dr. Tyler Smith's paper was illustrated by a number of beautiful drawings, which excited great attention among the Fellows, representing the novel points described in the paper, and which were made under the superintendence of Dr. Hassall.—Ed. 'Lancet.']—*Lancet, July* 3, 1852, *p.* 10.

121.—ON PUERPERAL CONVULSIONS.

By Caleb Rose, Rose, Esq., Swaffham.

[Mr. Rose first relates the histories of twelve cases of puerperal convulsions. Of these twelve, nine were primiparæ; of these eight were unmarried; of the remaining three, one was a third pregnancy, and the other two were twelfth pregnancies. In four cases, the convulsions followed the labour; in eight they preceded it: of these latter three children were born dead. In five cases, the urine, previously to labour coming on, had been albuminous. Mr. Rose proceeds:]

One striking fact in the history of puerperal convulsions is, that in a very large proportion of the cases recorded it was the first pregnancy, and many of the patients were unmarried women. It appears that there must be in primiparæ, particularly if they are unmarried, some powerful predisposing cause rendering them liable to the occurrence of convulsions. I believe this cause to be a peculiar state of the nervous system. A woman, in her first pregnancy, is apt to be irritable, mobile, and excitable; and it is very natural that she should be so; the novelty of the sensations incident to her situation, the dread of her approaching labour, and a degree of anxiety and apprehension as to its result, all tend to produce a state of erethism of the nervous system strongly predisposing to convulsions. This state, of course, is much more intense in some women than in others, and is likely to be more aggravated in an unmarried female, whose pregnancy subjects her to constant annoyance and vexations.

Looking upon this state of nervous erethism as the predisposing cause of the convulsions in the large majority of cases, some modification is necessary of the treatment generally recommended. I think that, in most cases, it is necessary to bleed, to obviate, in some degree, the effects of congestion; but, in this large class of cases, I do not think it is necessary or right to repeat bleeding after bleeding, simply because the convulsions continue; they are not very likely to cease until the uterus is empty, and, in all cases, time must be allowed before this can be safely accomplished. I have not had any experience of chloroform in these cases; but I should think it would often be very useful indeed, by suspending the convulsions while labour was progressing.

Diseased brain, intemperance, plethora, anæmia, uræmia, a state of nervous erethism, may all be considered to be predisposing causes of puerperal convulsions; but I think, with Dr. Tyler Smith, that the immediate cause of a convulsion is "the excited condition of an important class of the incident nerves of the spinal marrow,—namely, those passing to it from the uterine organs,—such excited condition depending upon pregnancy, labour, or the puerperal state." Sometimes a powerful emotion may produce a convulsion, occasionally, also, indigestible matters in the stomach, an accumulation of fæces in the bowels, or a distended bladder, may be the cause; but in the vast majority of cases the exciting cause is the before-mentioned condition of the uterine nerves.

In most cases, the main point in the treatment is to have the uterus emptied. The natural efforts will generally accomplish this; but, if labour makes but slow progress, and the convulsions are frequent, I

think delivery ought to be accomplished by artificial means as soon as it can be done with safety. Turning, when the head is above the brim of the pelvis, the forceps, when it is within reach, are the best means to use. Perforation, except when the pelvis is much distorted and small, I should think, cannot be required in a case of convulsions.

The special treatment of the case then is, to empty the uterus,—the general treatment must depend upon what may have been the predisposing cause of the convulsions in each particular case.

After the uterus is empty, and the convulsions still continue, with the patient restless and the pulse quick and weak, I have seen the happiest effects follow the administration of a full dose of opium; the convulsions have ceased; the patient has fallen into a quiet sleep of some hours' duration, from which she has awoke comparatively well.

In Case 11, the convulsions ceased, and a thick, rigid os rapidly yielded, after giving a quarter of a grain of ant. pot.-tart. every half-hour, with ten drops of laudanum.—*Med. Times and Gazette, July* 17, 1852, *p.* 61.

122.—CASE OF PUERPERAL CONVULSIONS FROM CEREBRAL CONGESTION, TREATED BY BLEEDING AND TARTARIZED ANTIMONY.

By J. B. Mawer, Esq., District Accoucheur to St. Mary's Hospital.

I was called in a great hurry, at nine in the morning of the 3rd of March, to visit Mrs. C. B——, a strong, muscular woman, of small stature, aged twenty-three, a patient of the St. Mary's Maternity, who was in labour of her first child. On entering the room I found her in one of the most fearful paroxysms of puerperal convulsions I had ever witnessed. The face was frightfully distorted, and purple from congestion; bloody foam was issuing from the mouth; the tongue was bleeding and protruded, the eyes fixed and staring; and several attendants were vainly endeavouring to restrain her in bed. Feeling that not a moment was to be lost, I instantly proceeded to take blood from the arm, by making a large orifice, from which, in a very short space of time, forty ounces of blood flowed. I then waited a few minutes, hoping that some good effects would follow so copious and sudden a loss of blood, but had the mortification to see no favourable change in the frightful character of the symptoms. I therefore removed my thumb from the opening in the vein, where I had with much difficulty managed to keep it during the violent struggles of the patient, and allowed thirty ounces more to escape in the same rapid manner. This second bleeding had at once a marked and beneficial effect, as the convulsions almost immediately ceased, a more natural expression of countenance returned, and she was shortly restored to a condition of apparent consciousness. I then removed most of her hair, and applied a bladder half filled with pounded ice to the head, and bottles of hot water to her feet. On making the usual examination, I found the os uteri about half dilated, but exceedingly rigid and tense, as were also the external parts. Just at this time I had the satisfaction of seeing my friend Mr. Musgrave enter the room,

followed shortly afterwards by Dr. Tyler Smith, whom I had sent for immediately on perceiving the serious nature of the case.

There was now an almost entire absence of uterine pain. The abdomen was carefully manipulated, but no movements of the fœtus could be excited or detected, though its rounded mass could be felt within the uterus. The fœtal heart could not be heard upon auscultation, so that it was concluded that the fœtus was probably already dead. As there was a calm in the convulsions, it was resolved to delay the performance of turning or craniotomy until more imperatively called for. It was agreed that it would be desirable to rupture the membranes as soon as practicable, and allow the liquor amnii to escape, so as to diminish the uterine distention. As these was still much general excitement of system, the pulse numbering 110 in a minute, and hard, and the os uteri and other tissues continuing very rigid, in spite of the previous depletion, it was felt necessary to follow the antiphlogistic plan, and with that view it was decided to try the full effect of tartarized antimony, as the medicine best adapted to fulfil the indications required. Accordingly nine grains of the salt were dissolved in six ounces of the camphor mixture, and an ounce of this solution was administered every hour during the day: such was the tolerance of the remedy, that not even the slightest nausea was induced by it, but it had the happiest effect in softening and relaxing the previously rigid condition of the parts. The labour pains, which had been quite suspended for about four hours, returned gradually about one o'clock, and I availed myself of the first opportunity which offered to rupture the membranes, when about a pint of water flowed away. I may here mention, that although no further convulsions occurred, she continued in a torpid and half-comatose state, the sense of vision especially being very imperfect. The uterine efforts became now strong and effective, but owing to the slow dilatation of the os uteri, the anterior lip was pushed down in front of the head in its passage through the pelvis, reaching almost to the os externum. I succeeded, however, at about seven in the evening, aided only by the natural efforts, in delivering her of a still-born female child, and having waited about twenty minutes, and no pain coming on, I extracted the placenta, which was partly in the vagina, and soon had the satisfaction of feeling the uterus well and firmly contracted. Dr. Tyler Smith saw her again with me in the evening, and a draught, containing one third of a grain of morphia and three grains of camphor, was administered, which had the effect of calming the nervous irritability and restlessness, which been for some time increasing. She slept profoundly the whole of the night, and on visiting her next morning I found her with a quiet intelligent smile on her countenance; her pulse 96 and soft; the skin moist and comfortable; the head free from pain, but feeling rather heavy; and having no recollection whatever of anything which had occurred during the previous twenty-four hours. I ordered her still to continue the ice-cap to the head, and to take a saline draught containing a diminished quantity of tartarized antimony every four hours.

On Friday, the 5th, she had a dose of calomel and colocynth, followed in a few hours by a draught of senna and salts, which cleared out the bowels very effectually. A purgative was afterwards exhibited every

alternate day. She continued steadily to improve without a bad symptom, and I have the satisfaction to state that she soon perfectly recovered. The secretion of milk on the fourth day was very abundant, and proved rather troublesome for some short time.

I must not to omit to notice, that on testing the urine I found in it no trace of albumen, nor was there any œdematous swelling of the legs —a fact of some importance in reference to the modern theory with regard to the nature of these congestive diseases of the brain, as it affords conclusive evidence that albuminuria does not universally obtain in these affections.

This case, I think, presents several other features of considerable interest to the practical obstetrician and to the profession generally. In the first place, it serves to confirm the imperative necessity of large and adequate depletion in the congestive variety of this formidable disease, affording at the same time ample proof of its undoubted safety and success. It also furnishes a remarkable example of the tolerance of tartar emetic—a fact long well established in reference to its use in pneumonia and some other pulmonary affections, but not, that I am aware of, to the same extent in cerebral disorders as this case so strongly illustrates, a grain and a half having been taken every hour for eight consecutive hours without the least nausea resulting from it. While speaking of this valuable medicine in connexion with this class of affections, it may not be out of place to add, that I have employed it with marked benefit in combination with camphor and morphia, (aided by cold applications to the head, and preceded by active purgation and leeches to the temples,) in two very severe cases of puerperal mania. General bloodletting being here for the most part inadmissible, it is very desirable to possess a remedy so available as this proved in both the instances referred to, in controlling the excited state of the circulation, and in tranquillizing the extreme irritability of the nervous system, both which conditions are so constantly present in the more active forms of this distressing malady.—*Lancet, May* 29, 1852, *p.* 516.

123.—*Bony Tumour of the Uterus.*—Dr. Crisp exhibited, to the Medical Society of London, a bony tumour connected with the uterus, which weighed twenty-two ounces; it occupied nearly the entire cavity of the pelvis, was of a globular form, and of so dense a structure that there was some difficulty in making a section of it. The patient from whom it was taken was 75 years of age, and the chief inconvenience she experienced was a difficulty in retaining her urine.—*Med. Times and Gazette, June* 19, 1852, *p.* 629.

124.—ON THE IMPREGNATION OF THE OVUM IN THE AMPHIBIA.

By George Newport, Esq., F.R.S., &c.

[The following are the conclusions and recapitulations derived from Mr. Newport's experiments and observations on this interesting subject:]

1st, then, the *germinal vesicle* disappears in the amphibia before impregnation; and before, or at the time of the bursting of the ovisac, and extrusion of the egg from the ovary into the cavity of the abdomen. It does not return to the centre of the yelk, nor escape to the surface, but is lost much nearer to the latter than to the former position; and its disappearance is the result of the endogenous development of cells in its interior. The egg is cast loose into the abdomen, and then consists only of the yelk mass in its vitelline membrane, and it is transferred to the mouth of the oviduct by the joint action of the abdominal muscles and the motions of the viscera, and not necessarily through the aid of the male during copulation.

2nd. Changes are going on in the constituents of the egg, both before and after oviposition as well in the unimpregnated as in the impregnated condition; but they soon cease in the former, and do not proceed to the cleaving or segmentation of the yelk.

3rd. That the egg is not susceptible of impregnation until after it has acquired the envelopes which it gains in the oviduct.

4th. That endosmosis of the entire egg takes place through these envelopes, and is most rapid during the few minutes the egg is most susceptible of impregnation. Further, that this endosmosis is augmented and hastened by an increase, and is lessened and retarded by a diminution of temperature; and that the susceptibility of the egg to become impregnated, and produce, is in exactly the same condition with regard to heat; whether the egg be exposed to, or whether it be excluded from light.

5th. That only extremely minute granules of solid matter can by any possibility pass into the tissue of the envelopes during endosmosis; and that there is no evidence whatever of the existence of a fissure or orifice, in the envelopes of the egg of the amphibia, at the time of, or before impregnation, capable of admitting the spermatozoon to the interior of the yelk-membrane or its contents.

6th. That it is the spermatozoon alone which effects impregnation; and that this does not take place until the spermatozoon is brought into immediate contact with the external envelopes of the ovum.

7th. That the *liquor seminis*, when entirely separated from spermatozoa, certainly does not effect impregnation.

8th. That although direct contact of the spermatozoa with the ovum is indispensable to effect impregnation, I have never been able to detect any traces of these bodies in contact with the yelk-membrane, or even within the substance of the external envelope.

9th. That impregnation is *commenced* the instant the spermatozoa are brought into contact with the egg, but a certain *duration of contact* is essential to its completion.

10th. That impregnation is not effected, when the whole or the majority of the spermatozoa in contact with the envelopes have previously become motionless, and apparently have lost vitality, as they are found to have done after the lapse of a longer or shorter period.

11th. That although an exceedingly minute quantity of spermatozoa suffice to impregnate the ovum, the phenomenon of impregnation takes place more tardily, even with duration of contact, when the number is

extremely limited, than when it is in full abundance, without excess; while, when the quantity is deficient, or the duration of contact too limited, then the phenomenon is incomplete, and partial impregnation only is effected.

12th. *Partial impregnation* is shewn in imperfect segmentation of the yelk; and is due chiefly to the spermatozoa being insufficient in quantity, or in duration of contact, or inefficient through diminished vitality; and it may also result from diminished susceptibility in the ovum.

13th. Partial impregnation of the ovum is of frequent occurrence, as I found in my first experiments with fluid that had passed through filtering-paper, but which still contained a very few spermatozoa, either motionless or exceedingly feeble; and further, partial impregnation is of much the most frequent occurrence when the ova are placed in dense fluid before contact with the spermatozoa, as in the experiments with carmine.

Lastly, When the ova are only partially impregnated they are usually, and perhaps always unproductive.

The facts now enumerated lead us to inquire, whether impregnation takes place through any catalytic influence of the spermatozoa, as suggested by Bischoff, while in a state of activity, and at the instant they are brought into contact with the ovum, or whether impregnation results from a diffluence of the spermatozoa thus brought into contact with the surface, the substance into which they may be dissolved being carried by endosmosis with the water imbibed through the tissues; or whether it is the result of the conjoint influence of both these conditions;—the first action induced being instantaneous and catalytic, and possibly dependent on the persistence of organic vitality in the spermatozoa, while the completion of the impregnation may depend on the imbibition of some material influence or substance derived from the impregnating body. This is a view, which the gradual disappearance of the bodies of the spermatozoa from the surface of the ovum, both in the frog and newt, seems to favour; as we have already seen that endosmosis is an active and important function of the envelopes of the ovum at the very period when impregnation is effected.

All the experiments now detailed seem to shew that in those vertebrata which expel their ova into water before impregnation, as in the tail-less amphibia, and in which,—from the nature of the medium into which the ova are passed,—we may infer that the function takes place most quickly, impregnation is commenced at the very instant of contact of the spermatozoon with the ovum, and even may be completed within very short spaces of time,—but *duration* of at least some seconds of actual contact—even in these animals' ova, is essential to the perfection of the function. But this period, we may fairly conclude, may differ in different classes of animals, and possibly may have some relation to the greater or less facility with which the spermatozoa are brought into contact with the ova.

When the experiments last detailed are compared,—the effects produced by the application of media which influence the spermatozoon and the ovum chemically—with those of which the effect is merely mechanical, we seem to have made some advance towards a future knowledge of the nature of the impregnating power. Although we are as yet entirely without

proof, that any material influence or substance is actually transmitted from the spermatozoon on the surface of the ovum to the yelk, in the interior, we have evidence, that fluids are imbibed by the ovum by endosmosis through its tissues; and, although not a trace of the spermatozoon is detected in the interior of the ovum, we have seen that it remains for a long time on the surface, and gradually disappears, apparently by diffluence; so that it may be fair to conclude, that the agency of this body is material in its operation. On the other hand, the effect which we find is produced on the yelk by the direct and even momentary contact of the spermatozoon with the envelopes of the ovum, seems closely to resemble that of the so-called catalytic power of certain known bodies, in so far as that contact, during only very short spaces of time, with the surface of the ovum, appears to be sufficient to induce certain changes in the interior. These changes, too, as known of catalysis, are carried only to a certain extent when the exciting agents,—in this instance the spermatozoa,—are feeble in action or but very few in number; and then, as we have seen. the yelk may become only more or less partially segmented; or the changes in it, having proceeded to a certain extent, may then become arrested, apparently from deficiency of the originally exciting cause.

Then, again, we find that although segmentation of the yelk may take place, embryos are not produced unless there has been some continuance or duration of contact of the impregnating with the impregnated body; and that the number produced seems to have reference to the duration and to the full sufficiency of the exciting cause. But neither what we at present know of the so-called catalytic power or of endosmosis, appears alone to be sufficient to account for the whole of the phenomena of impregnation. Simple contact of the spermatozoon does not appear to be sufficient to determine the transmission of more or less of the material structural characters of the male parent to the offspring; while diffluence and endosmosis of the substance of the spermatozoon can hardly be imagined to occur in a brief second or two of time sufficiently to effect the full impregnation of the yelk, and induce its invariable consequence, segmentation. Possibly, we may hereafter find that the first changes induced by contact of the impregnating body are completed by its diffluence, and by the material constituents into which it is dissolved being transferred to the yelk by endosmosis.—*Edinburgh Med. and Surgical Journal, July* 1852, *p.* 44.

125.—PARALYSIS OF BLADDER FROM OVER DISTENTION AFTER DELIVERY, SIMULATING PERITONITIS.

By Dr. John C. W. Lever.

[In this case, twenty-four hours after delivery, symptoms resembling peritonitis supervened. The labour had been tedious and protracted—but no manual or instrumental interference had been required. Dr. Lever passed the catheter and drew off seven pints of urine, by which the symptoms were speedily relieved. The bladder, however, from over distention was afterwards found to have lost its contractile power, and the catheter was required twice daily for its relief. Nine weeks after her confinement she was admitted into the hospital].

Appearance on Admission.—She was a tall, good-looking girl, with dark hair, fair complexion, and delicate skin; of a very happy and contented disposition, and sanguine temperament; she appeared in tolerably good health, but weak, not having been out of bed since her confinement; her appetite was good; and all the functions of the body properly performed, with one exception, viz., that of the bladder, which had totally lost its expulsive power; she suffered no pain or uneasiness about the pelvis, and the uterus, by vaginal examination, had regained its normal condition, and was not in any way displaced; pulse good, about 82; tongue clean; *urine* high-coloured and somewhat ammoniacal, but in other respects healthy.

She was ordered to be electro-galvanised three times a week. Water to be drawn nocte maneque. ℞. Tinct. ferri sesquichloridi, ♏x, ex inf. quassiæ, t. d.

April 15*th.*—The galvanism caused a good deal of pain for some time after its application, but at present with no manifest benefit; the urine appeared to flow a little faster, and the bladder did not require such constant pressure with the hand as it did when she was first admitted to thoroughly empty it; urine still offensive.

20th.—Continued about the same, had regained no control of the bladder as yet; to-day the menses appeared for the first time since her confinement; she was still happy and in good spirits.

To have the electro-galvanism applied every day, beginning on Monday.

23d.—Left Hospital in consequence of some disagreement with the sister.

25th.—She called on Dr. Lever, stating she had passed her water on the evening of the day she arrived home, and ever since had been able to dispense with the use of the catheter. Dr. Lever ordered her to attend the hospital to be electrified daily for a week.

30th.—She still continued to pass her water voluntarily, but was compelled to do so seven or eight times a day, and two or three times at night; the urine scalded her, and was sometimes offensive; she appeared much improved in strength and health, but complained of fulness, bearing down and weight in the perineum, with a tendency of the womb to prolapse. She had nearly taken all her medicine, and would attend on Saturday at the out-patients' room.

May 4th.—Had continued to pass her urine without any difficulty, the bladder losing its irritability, and retaining its accustomed quantity without inconvenience. Ordered to attend the electrifying room three three times a week, and to take decoct cinchonæ c., acid. nit. dil. ♏xj, ter quotidie.

I was called to this patient, her attendants supposing she was suffering from puerperal peritonitis, but the diagnostic symptoms were wanting; pain there was and increased by pressure; the pulse quickened, but not *wiry*; the skin moist, and the perspiration had an urinous smell; her position was peculiar, but was that which I have often remarked in over-distended bladder; the hand pressed upon the perineum. The introduction of the catheter soon solved the doubt, and her recovery of the power of micturition, I believe is due to that valuable agent, recommended by Dr. Radford, of Manchester.

She has been confined a second time, but suffered no inconvenience.—*Guy's Hospital Reports, Vol.* 8, *part* 1, *p.* 41.

126.—ON THE DIAGNOSIS OF CHRONIC OVARIAN TUMOURS.

By Dr. E. J. Tilt.

Ovarian Tumours may be confounded with Tumours of the Unimpregnated Womb.—Retroversion and retroflexion of the womb have been mistaken for incipient ovarian tumours, fallen into the recto-vaginal pouch, or confined there by false membranes. On examining, by the vagina, a patient suffering in this way, we may find a circumscribed tumour at the posterior portion of the vagina, painful on pressure, and resembling the fundus of the womb; but on a more careful examination, the os uteri will be found in its proper position looking backwards, the body of the uterus forwards. The mobility of the tumour, by the uterine sound previously introduced, will show whether or not it be uterine.

Retroflexion of the womb is more likely to simulate incipient ovarian cysts; for, as in this affection the fundus uteri is thrown back upon itself like the belly of a retort, while the os uteri remains in its natural position, the finger feels a tumour directly behind it, between the rectum and the vagina, but here again the uterine sound soon clears away any doubt that may have arisen, for it will be found that the concavity of the instrument will be obliged to pass backwards, following the course of the cavity of the womb, and through the walls of the tumour; the point of the instrument may sometimes be felt by the finger placed in the vagina. By a careful manipulation the tumour may be made to disappear and to re-appear so often as it is restored to its natural position, or again directed from it by the sound.

Ovarian Tumours may be confounded with Abscess of the Walls of the Womb.—Case.—Some years since Professor Recamier was consulted by a medical man for his wife, who had long suffered from what was called ovarian dropsy. On making a very careful examination, Recamier discovered a round tumour about the size of a pigeon's egg, situated between the rectum and the uterus. On exploring the rectum with the index of the left hand, while that of the right remained in the neck of the womb, more than usually dilated, he felt fluctuation, and as the pus seemed nearest to the posterior wall of the neck of the uterus, Recamier determined on making an incision there. To perform this operation, he placed the index of the left hand in the neck of the uterus, and guiding a convex bistoury on the pulp of the finger, he plunged the extremity of the bistoury into the abscess, a few teaspoonfuls of pus came out, and to facilitate its egress he enlarged the inferior angle of the wound, by completely cutting through the posterior lip of the os uteri, the index of the left hand placed in the rectum serving to guide the bistoury, and prevented too deep an incision. During the following day a small quantity of pus was voided. Frequent injections were made, and the patient soon got well. This case shows how to detect and to cure similar instances of disease.

Ovarian Tumours may be confounded with Abscess of the Cavity of the Womb.—Husson presented to the Anatomical Society of Paris a case of this description, the neck of the womb was completely obliterated, and its dilated cavity contained two tumblers of pus. Maisonneuve saw

a similar case in a woman who died from cholera; and Dr. Reignier has repeatedly observed the same appearances in the old women of the Salpètrière—the asylum for aged women in Paris. In Husson's case, the woman had experienced no symptoms, but some of Dr. Reigner's patients were troubled with bearing down pains. We admit that a case of that description might be taken for an ovarian tumour, and then, if a careful recto-vaginal examination were made, the swelling would be referred to the womb. If, on making a speculum examination, the womb were found obliterated, the presumption would pass into conviction; and if not, then the uterine sound would show whether the womb was normal and the tumour ovarian. The rarity of the case must be borne in mind.

Ovarian Cysts may be confounded with Hydrometra, or a Collection of Water in the Womb, and we do not doubt but that some of the cases described as cases of spontaneous cure of ovarian cysts are to be referred to the rupture of such uterine tumours. The distension of the impregnated uterus by an aqueous liquid has been lately contested by Naegele and by Stoltz, although it is difficult to see why the mucous surface of the womb should not secrete a large quantity of limpid fluid, as well as the mucous surfaces of the maxillary and frontal sinuses. The disease has been too well described by Ferrelias (Patho. Liv. vi., chap. 15), by Mauriceau (Traité des Maladies des Femme Grosses, tom. i., p. 74), by Lisfranc (Clinique, tom. iii., p. 346), to be thus denied. Dr. Storrey has also described a case (Haye's Journal, 1850). It will not do to say that the aqueous discharge comes from the ovary, because Vesalsus, Blank, and Nicolai have opened women who had long suffered from this disorder, and found the womb containing 84lbs. and even 180lbs. of serum. This disorder is accompanied by the symptoms of pregnancy, and is generally considered such until after the ninth month of its duration. Then it is generally regarded as ovarian. In a case carefully related by Blegny (Journ. de Médecine, tom. ii., p. 97,) it was allowed to exist for twelve years, and the noble lady subject to this infirmity was only delivered from it by the violent concussion of coughing, by which means a large quantity of water was discharged.

After fully ascertaining the impossibility of the womb being distended by a child, it would be well to imitate Lisfranc, who, in one of his cases introduced a sound into the womb, and cured the patient in a month. Cruveilhier says, that in the few cases of this description that he had met with the disease was always taken for pregnancy, and the mistake only found out by the evacuation of the water. We ourselves have been similarly deceived, as in the following instance:—A lady, 25 years of age, and married three years, was said to be affected with ovarian disease, and consulted us for that disorder. She complained of swelling of the abdomen, uterine pains, and slight leucorrhæa. Her breasts were swollen and painful, the nipples were surrounded by a dark circle, and a yellowish creamy substance came from them. The catamenia had desisted for three months. Suspecting pregnancy or an uterine affection, we examined her, and were confirmed in our diagnosis by a dilated orifice, and a softening similar to what is met with at the third month of pregnancy. On making a speculum examination, the

vagina was more livid than in an unimpregnated woman, and the os uteri was similar to what it should be in the first months of pregnancy. We pronounced the patient to be in the family way; but unsatisfied with our report, she consulted another doctor, who considered her case to be one of inflammatory granulation of the os uteri. He cauterized the cavity of the neck with nitrate of silver; but the night after the second cauterization the lady was surprised at finding herself wet, and on her placing herself on the commode, she passed (without making urine) two pints of clear water, "similar," said her mother, "to the bursting of waters in a confinement." For two days did this water continue dribbling from her, when the swelling of the abdomen disappeared, all other symptoms vanished, and the catamenia reappeared two months after. Thus the patient had neither ovarian dropsy, as was at first believed, nor uterine inflammation, as was afterwards stated; neither was she pregnant, as we imagined. Our diagnosis was founded on rational grounds; and the error could only have been made clear by passing the uterine sound into the womb, which would have been an *unwarrantable* proceeding; for as such cases are extremely rare, and as pregnancy is an event of every-day occurrence, the risk of abortion would have been too great. In this case, therefore, the patient owed her recovery to an error of diagnosis.

Ovarian Tumours may be confounded with Cystic Tumoûrs in the Substance of the Uterus.—In the Museum of the College of Surgeons of England there is a preparation removed from a patient in whom this mistake took place; (Home 980, uterus 23,) it displays a portion of the uterus in which a large encysted tumour had formed. The patient had been twice tapped, and the cyst emptied. By means of the sound such a tumour might have been shown to be uterine, before it attained to a considerable size, or after it had been emptied, but at other times the possibility of distinguishing it from an ovarian cyst would be very great, if not impossible.

Ovarian Tumours may be confounded with the Uterus Distended by the Menstrual Secretion.—Mr. Benjamin Travers, jun., witnessed such a case in St. Thomas's Hospital, under the late Dr. Williams. Examination per vaginam detected a fluctuating tumour, which was freely opened with an abscess-lancet, and a large wash-hand basin was filled with the retained menstrual fluid. The patient was in bad health, and presented general symptoms which led to the belief that the tumour was ovarian. Such a case Mr. Travers thought might again be mistaken for ovarian dropsy.

Roussell mentions a similar case, where all the symptoms of pregnancy were found, and only dispelled at the ninth hour by a copious discharge of dark blood. A careful examination, corroborated by the fact of the patient's age, and by the history of the case, would, however, easily permit of a correct diagnosis. It may be well also to bear in mind, that the uterus, distended by retained menses, is not always regularly developed, but may increase to the right or the left, and give that obscure perception of fluctuation which is frequently found in a malignant mass. On each side of the central tumour may also be found smaller elongated tumours, formed by proportionally-distended oviducts, with obliterated

abdominal ends, as in the case related by Dr. Jackson, in the 'American Journal of Medical Sciences.'

Ovarian Tumours may be confounded with an Accumulation of Gas in the Womb.—Mauriceau, Schmitt, M. Lefevre, and many other authors, have seen examples of this singular occurrence. In Mauriceau's case the patient was 50, thought herself pregnant, had prepared every thing, when her hopes of progeny vanished in wind. The obliteration of the os uteri on the one side, and the clear sound furnished by the distended womb, will, we trust, enable the practitioner to prevent a woman in future giving so much trouble to herself, and so much amusement to her neighbours.

Although it be denied by Naegele and Stoltz, that the unimpregnated womb can be distended by gas, the fact is admited by modern practitioners; by Peter Franck, (Med. Pract.), by Columbat de L'Isere (Traité des Maladies des Femmes, tom. ij., p. 781), and lately by Dr. Teisser, of Lyons (Gazette Med. de Paris, Jan., 1844). In these cases menstruation ceased, the patients were thought pregnant, one of them even said she felt the movement of the child, but after the noisy expulsion of fetid air by the vulva, the symptoms of pregnancy disappeared. Why should not the mucous membrane of the uterus sometimes secrete air, as well as the bladder or the intestines? Why should it not be retained if the surface of the womb is agglutinated?

Ovarian Tumours may be mistaken for Uterine Fibrous Tumours.—This mistake is much more liable to occur than any of the preceding, because the frequency of such tumours is great. Operators have often been deceived by these tumours, for we find that Messrs. Lizar, Heath, Otter, and Atlee have operated for ovarian disease, and only found an uterine tumour; and when they are pediculated, and thus easily moved, and central, as are ovarian tumours, it is difficult not to be mistaken. The absence of fluctuation, the hardness of the tumour, the very gradual progress of the disease, may indeed allow one to affirm that the tumour is solid; but were it not for the uterine sound, it would be difficult to affirm that it is not ovarian.

If we find that the uterine sound passes, as it were, into the morbid mass, if there is no possibility of separating the womb from the tumour, and if every movement given to the tumour conveys similar movements to the sound, we may consider the tumour uterine; but if we find the uterus small, and moveable, if the sound passes anteriorly to the tumour, and can be separated from it, and when thrown upon the rectum it appears healthy, then we may confidently affirm the tumour to be ovarian. The cavity of the womb may be lengthened, and the sound will indicate the modification of structure; but although the sound may only penetrate the womb to its normal depth, or two inches and a half, still the uterus may not be normal, for its enlarged cavity may be filled with a fibrous tumour, as in Dr. Atlee's fourth case.

Case.—In Dr. Simpson's ward at the Royal Infirmary, in Edinburgh, we saw a woman with a considerable enlargement of the belly, occasioned by a tumour, which had all the appearance of being ovarian, for it was central, moveable, and round. Such would have been the diagnosis of most medical men; but Dr. Simpson passed the sound seven or eight

inches, and made us feel its extremity high up on one side of the tumour, whose nature and seat it thus indicated as uterine.

Such is the value of "a bent wire," when bent by the hand of genius, and it will long perpetuate the memory of its originator; but this instrument may still sometimes deceive us, and cause us to take an ovarian tumour for one of uterine origin, as in the following case related by Mr. S. Lee:—

Case.—A patient presented herself with an abdominal swelling on the right side, hard, and without fluctuation, not at all moveable, but it could be traced down into the pelvis; it had been a considerable time in its formation. The examination per vaginam discovered that the brim of the pelvis was occupied by a solid tumour; a small nodule was felt rather in front of the centre of the pelvic cavity, in which was the os uteri. The sound passed upwards and forwards nearly four inches; it moved with difficulty, as through a cavity, the sides of which were much compressed. This examination was made in December.

Here, then, you have every characteristic of a fibrous tumour in the posterior walls of the uterus. The cavity is elongated. the uterus is fixed by the brim of the pelvis, and the tumour in the abdomen is hard and smooth, possessing no fluctuation. The tumour now rapidly increased, and in the January following had occupied the whole cavity of the abdomen. There was then distinct fluctuation in particular parts, and this fact disclosed to us the real nature of the case, viz., that it was a multilocular cyst, complicated with much solid matter. The reasoning from these symptoms was correct, although they were afterwards found peculiarly complicated; for instance, the uterus was quite healthy, and unconnected with the tumour, but the tumour had so elongated the left corner of its body, and so elevated it, that the uterine sound passed into the cavity thus formed, and the tumour itself contained such a large quantity of solid matter, that it pressed so strongly the uterus between itself and the pubes, as to cause it to become fixed and immoveable, consequently leading us to suppose it to be a fibrous tumour.—*Provincial Med. and Surgical Journal, August* 1852, *p.* 417.

127.—ON THE DIAGNOSIS, TREATMENT, AND PATHOLOGY OF OVARIAN TUMOURS.

By Dr. Frederic Bird, Lecturer on Midwifery and the Diseases of Women at Westminster Hospital.

[The patient in the following case, when first seen by Dr. Rigby and Dr. Bird, is stated to be 18 years of age. At the age of 13, the system was much depressed by an attack of measles, quickly succeeded by scarlet fever. When menstruation commenced it soon became inordinate, and constantly required the administration of remedies to check it. Menorrhagia at one time became alarming; but under the treatment of Drs. Marshall Hall and Hamilton, this symptom was relieved. Very soon, however, evidences of ovarian tumour presented themselves. On examination externally, there was found great abdominal enlargement, though

the rest of the body was emaciated; abdomen distended to a maximum circumference of 38 inches; the enlargement is symmetrical; viewed in profile, the umbilical region presents marked prominence; the pulse ranges at 100.]

Internal examination finds the uterus drawn high up in the pelvis, but, by the introduction of the sound, is proved to be quite moveable, while sharp palpitation of the abdominal swelling conveys no impulse to it.

The opinion given by Dr. Rigby and myself was, that the case was one of uncomplicated ovarian tumour—that it consisted principally of one large cyst, and as yet had not formed adhesions to surrounding parts, and might be removed by the operation for excision. We not only believed that the tumour could be removed, but advised its immediate extirpation.

The latter part of this opinion was based upon the facts, that the tumour had rapidly increased in size,—that the powers of the patient were so much reduced that any great delay would preclude altogether the probability of her enfeebled system sustaining the shock of a severe operation; and that, setting aside the urgency of the general symptoms, the frequent and often profuse menorrhagia, over which remedies had been proved to have little control, was in itself an important source of exhaustion, and dependent as it probably was upon the ovarian disease, would continue to aid the work of constitutional exhaustion, and thus accelerate the only termination that could rationally be expected—death.

Another and always important reason for advising the operation, was presented by the mental condition of the patient. Endowed with high intellectual qualities, and supported by equal moral firmness, it was only necessary to explain to her the proposed treatment, for it to be at once understood and accepted. Her well-tutored mind never vacillated; and, from the moment of the opinion being communicated to her to the completion of her cure, she neither hesitated nor complained, but passed through her period of suffering and anxiety with calm and thoughtful fortitude.

The unavoidable delay of a week from the time at which the above opinion had been given, afforded an alarming evidence of its correctness, for, at the end of that period, the patient began to sink rapidly and could not have survived many days. The operation was immediately performed.

Dr. Rigby, Mr. Skey, and Mr. Barnard Holt, were present. The room being filled with moist air at the temperature of 80°, and the patient placed in a convenient position in bed, Dr. Rigby brought her under the influence of chloroform so speedily and easily, that, without the slightest movement or changed expression of the countenance, she passed in a few moments into quiet sleep, from which she did not awake until the tumour had been removed.

An incision of about an inch long was first made in the course of the linea alba, a little below the umbilicus, into the peritoneal cavity, the edges of the wound quickly becoming retracted, and making visible the large blue cyst of the tumour beneath. A moment's observation sufficed to note its mobility and absence of adhesions. Using the forefinger as a

director, I immediately passed the bistoury upwards a little beyond the umbilicus, and downwards nearly as far as the pubis, making the incision about six inches in length. A little bleeding followed the division of two small arterial branches; but, from the pressure of the tumour against the edges of the wound, no blood could pass into the abdominal cavity. Torsion applied to one vessel, and ligature to the other, arrested the slight hemorrhage, which only required such interference because delaying the completion of the operation. The cyst was then grasped by the forceps, its cavity opened, and escape given to about sixteen pints of fluid. As its contents passed out, the cyst continued to advance steadily under gentle traction, and when reduced to a fourth of its former bulk, was lifted from out the abdominal cavity, remaining attached to the right side of the uterus by a thick pedicle, formed of thickened broad ligament, margined by the Fallopian tube, and containing within it the round ligament and two arteries, one of which was of larger size than the other, and ran near to and beneath the tube. A very strong double ligature was next carried through the middle of the pedicle, a portion of the ligamentous structure and tube divided, and a ligature firmly tied on either side, their ends being subsequently braided together so as to make one cord. The knife was then carried through the pedicle at a very short distance from the ligatures, and the extirpation of the tumour was complete. The divided vessels of the pedicle having been seen to be quite secure, and the ovary on the left side found healthy, the lips of the abdominal incision were brought together by sutures, and closed at every part except at the inferior angle, through which the ligatures passed. As much traction was maintained upon the united ligatures as was necessary to prevent their recession into the abdominal cavity, cold water dressing applied, and a very light bandage passed round the body.

There had been but little variation in the pulse, either from the operation or the action of the chloroform; and, although it was temporarily weakened and quickened after consciousness had been restored, yet its altered state was rather attributable to mental than physical causes. The use of a little stimulant soon improved its character, and in less than an hour after the removal of the tumour it was moderately full, regular, and 90. At the expiration of that time she was visited by Dr. Rigby and myself; and, influenced by the fact of the patient having, on some former occasion suffered from the exhibition of opium, the extract of hop, in full dose, was substituted, with the object of procuring repose. The temperature of the room was reduced to 70°, and it was ordered that a little ice should be given from time to time.

℞. Ext. humuli gr. x. Ft. pil. ii., statim sumendæ.

From this hour until the time of danger had passed, the progress of the case was constantly watched by Dr. Rigby and myself; but it will only be necessary to record the symptoms presented by the patient, and the results of our consultations at the following dates:—

3rd hour after the operation.—The patient lies in a perfectly easy position, presents a cheerful countenance, and has no symptom to complain of. She is without pain or sickness, but is not disposed to sleep; pulse has continued to increase in frequency, and now ranges at 110; the skin has become hot, and there is some headache and intolerance of

light; very little perspiration has occurred. The catheter has removed about three ounces of water.

Rep. extr. humuli gr. xv., statim.

6th hour.—Still sleepless, but without pain; nausea, scarcely amounting to vomiting, has occurred occasionally; the pulse has risen to 118; the skin more hot and dry; the abdomen a little distended; urine secreted freely. The temperature of the room now increased to 80°. Ice and iced-water administered in larger quantities, additional clothing placed on the bed; cold water freely applied to the wound and lower part of the abdomen, the wetted napkin being covered by oil-silk, or dry cloths, and the anodyne repeated.

9th hour.—Soon after the last report, the skin began to act freely, the pulse diminished in frequency, until it now ranges at 100; urine was copiously secreted, and removed by catheter; headache has ceased, and she has had refreshing sleep. The temperature of the room to be kept the same, unless faintness be complained of, when it is to be reduced. The iced-water to be freely given.

Rep. extr. humuli.

12th hour.—She sleeps tranquilly.

2nd day.—Has passed a very quiet night, perspiring always gently, sometimes freely. She has not slept many hours, but has been perfectly easy. The ice has been freely taken, and now a little arrow-root is allowed. The pulse has continued to lessen in frequency, and is now 94, and of natural character; the abdomen is a little more distended by flatus, but less so than in similar instances; urine in full quantity, removed by occasional catheterism. The wound presents a very healthy appearance, and the ligatures are but slightly tightened by the flatulent distension.

In the evening the pulse became a little accelerated, and the skin was less disposed to act; there was some slight headache, and no aptitude for sleep. The temperature of the room, which, during the day, had been lowered to 70,° was ordered to be raised to 80°; iced water in larger quantities being, at the same time, given, and as soon as active perspiration ensued, the following:—

℞. Ext. humuli gr. xv.; Ft. pil. iij. statim sumend., et post horas duas repetandæ si opus sit.

3rd day.—A good night is, this morning, followed by improvement; the pulse rather feeble, is under 90; the urine, evacuated by catheter twice in the night, healthy; the skin moist and cool; the abdomen scarcely at all distended; the wound healing, and the appetite returning. The bowels have acted but inefficiently, and the dejections contain little bile.

In the evening there was some return of headache, perhaps consequent upon a little addition to her very low diet of beef tea, and she was indisposed to sleep. The tongue had become a little coated. Temperature to be kept up at 70°.

℞. Hyd. c. cretâ, gr. iij.; ext. coloc. co. gr. vj. In pil. iij. divid., statim sumendæ.

4th day.—The night has been passed comfortably; there has not been much sleep, but there have been no important symptoms; the bowels,

disposed to act, were assisted this morning by a simple enema, and have now been fully relieved; the secretions go on well; the pulse is about 88; the skin and tongue healthy.

5th day.—Progressing satisfactorily; there are no symptoms to record: the cather is still used. The diet has been improved, and a little wine, much diluted, allowed as beverage; the dejections are deficient in colour; fresh cool air has been freely admitted into the room.

Ordered: ℞. Pil. hydrarg. iij., ext. fellis bov. inspis. gr. v. Fiant pilulæ ij., horâ somni sumendæ.

6th day.—Copious relief from the bowels, with much bile, has resulted from the pills. In all respects she is progressing well. The hop extract is still taken at night, and with good effect.

7th day.—Continues to improve; diet increased; bowels regular; pulse 78.

14th day.—From the date of the last report there has been no important deviation from a rapid and progressive improvement. More nutritious diet has been cautiously allowed, under which she has quickly acquired strength, and has only kept in bed to prevent disturbance of the ligatures. The wound has healed at every point, save that through which the ligatures pass; the sutures were removed several days since; the regular action of the bowels has been maintained by the occasional use of the ox-gall; the catamenia have occurred, and without the former tendency to profuseness; the bladder has still been relieved by the catheter, for although the power of expulsion has been regained, it has been found difficult to employ it without causing pain in the course of the ligatures. From time to time, the detachment of the ligatures has been assisted by gentle traction and torsion alternately, and they were to-day withdrawn from the wound without difficulty or pain, bringing away in their terminal loops a small portion of dead ligamentous tissue.

28th day.—Speedy convalescence forms the only note made since the last report. A little irritability of the bladder has once or twice occurred, probably from the previous frequent catheterism, but has yielded to the same simple means by which sleep had been procured,—the extract of hop,—and micturition is now performed as healthily as are all the other functions of the body. The only treatment has consisted in good diet and carriage exercise, and the improvement in strength has been remarkable.

When borne down by the exhausting tax of her disease, no food or tonics served to sustain her, or to do more than afford a short-lived improvement; but now, freed from her cause of suffering, she has become comparatively strong, and enabled to take exertion to which she had long been inadequate. The spinal incurvation consequent upon the pressure of the tumour has disappeared, the widely-expanded ribs have resumed their natural position, the abdominal walls have contracted, and the general figure is perfectly restored. The wound has continued to cicatrize, and is now marked by a fine linear scar of less than two inches in length.

Soon after this period the patient left London, and a report, sent a month subsequently told of her enjoying good health and strength, of having become stouter, of being able to take active exercise on horse-

back, and of presenting no traces of the ill health from which she had long and patiently suffered.

The tumour which involved the right ovarium, was examined immediately after its removal, and presented the following features:—Its total weight was about 20lbs.; its figure nearly ovoid; it was principally formed of one large primary sac, containing, at its base, a mass of very small secondary cysts, densely aggregated, and filled by thick mucoid secretion, of light colour; while the fluid contained in the large cyst was darker, being light brown, and scarcely viscid. This latter fluid had a specific gravity of 10·40, contained a small proportion of albumen, much mucus, and, after standing, presented a small quantity of cholesterine on its surface, and became of lighter hue from the deposition of dark matter, which afterwards proved to be altered blood. The primary cyst varied little in thickness, was thinner above and thicker below, but averaging about four or five lines; it was of a light, bluish white tint, to which irregularly scattered veins gave in many points a darker hue. The arterial vessels, which ran in great numbers over the cyst, were very small, except at their origin from the two vessels traced into the pedicle, one of which appeared to be about the size of the temporal artery, the other smaller. Over the lining membrane of the cyst by far the greater number of vessels seen were veins, many of which were of considerable size; a few small pedunculated cysts, filled with watery fluid, were seen scattered over the interior of the parent sac. Over the lower portion of the tumour the broad ligament was seen to stretch; and, near to it, the Fallopian tube, much elongated, could be traced, passing upwards in a somewhat curved direction.

The pedicle of the tumour, which could not have exceeded half an inch in length, was nearly the same measurement in diameter, and was formed by the ligaments, the Fallopian tube, which was of more than usual size, two arteries of unequal size, and three rather small veins. Over the anterior surface of the tumour, a very few and minute filaments of lymph could be observed, but in no part sufficient to give rise to adhesion with the parietal peritonæum.—*Med. Times and Gazette, Aug.* 21, 1852, *p,* 185.

ADDENDA.

128.—ON THE CHEMICAL SUBSTRATA OF THE HUMAN BODY.

By Dr. G. E. Day.

[In an interesting and clever review of 'Lehmann's Physiological Chemistry,' Dr. Day gives an excellent epitome of the *substrata* of the animal body, treated of by Lehmann in his first volume. Dr. Day remarks:]

On reviewing the chemical substrata of the animal body, treated of in the first volume, we perceive that there are four groups of substances in which the vital processes are most intensely manifested; or, in other words, which most actively participate in the metamorphoses of the animal tissues. These are:

1. *The albuminous substances or protein-bodies, and their derivatives.*
2. *The fats.*
3. *The carbo-hydrates, and*
4. *The inorganic salts.*

That *albumen* is one of the most important substances in the animal body is sufficiently obvious from the positions to which it occurs: we find it in the greatest quantity in the blood, and in all those animal juices which principally contribute to the nutrition of the organism; however, a chemical investigation of various tissues shows us that albumen only requires slight modifications to enter into other forms; as, for instance, that of syntonin, or muscle-fibrin, the essential constituent of the solid contractile parts by which alone both the voluntary and involuntary movements of the animal body are accomplished. We find it both in its fluid and solid form in that most complex of all structures, the nervous system, both in the nerve-tubes and in their contents. In association with a little fat and traces of sugar, the ovum consists merely of albumen and casein holding salts in solution; and there can be no doubt that with the co-operation of the oxygen conveyed by the blood, all the tissues are formed from the protein-bodies, although we are not as yet in a position to explain with certainty the exact nature of the changes by which the gelatigenous and certain other structures are produced.

The fats next claim our attention. Their physiological value and their mode of origin have been noticed at some length in the first volume; we will here simply mention, that without the intervention of fat no colourless blood-cells, and therefore no red corpuscle, could be formed; indeed, no animal cell or fibre of any kind. While, however, in the normal state, the fat takes an active part in cell-formations in the animal body, we also, in some cases, perceived a tendency to a formation or production of fat in existing cells and tissues whose nutrition has been

peculiarly modified. The phenomenon commonly designated as fatty degeneration admits of a double explanation. We may either assume that the pre-existing fat, under the influence of certain molecular forms, is accumulated in the older and less vitally active cells, and replaces the nitrogenous textural particles as they become worn out; or that the fat is produced directly from the nitrogenous textures of the cells or fibres, the nitrogen being developed in the form of ammoniacal salts, and the fat being left as a product of decomposition. Lehmann, in his first volume, supported the former view as the least hypothetical of the two, and as the more probable from its simplicity; since the date of its publication Wagner and Liebig have, independently of each other, instituted certain positive experiments which very much strengthen the second view. Wagner made the remarkable observation that crystalline lenses, pieces of dried albumen from eggs, and other substances poor in fat, which were introduced into the abdominal cavity of birds, were perfectly changed in their texture in the course of from twenty-five to fifty-four days, the residue containing far more fat than existed in the original substance. Liebig has shown that the metamorphosis of the albuminous tissues of the animal body into fat is, in a chemical point of view, not only possible but probable. Both in the putrefaction and in the gradual oxidation (by chemical means) of albuminous substance, the results, under favourable conditions, are ammonia and fatty acids, such as the butyric and the valerianic.

These experiments and observations of Wagner's and Liebig's are, at all events, sufficient to show that there is no chemical absurdity in assuming that, under certain circumstances, fat may be a product of the decomposition of the protein-compounds.

The carbo-hydrates, constituting the third group, are in many respects closely allied to the fats. The substance of this class occurring in the animal body are, dextrine, milk-sugar, inosite, and glucose; to which, perhaps, we should add cellulose, occurring in the investments of the tunicata. Recent investigations have detected sugar, in small quantities, in almost all the fluids subservient to nutrition, as, for instance, in the blood, transudations, lymph, chyle, the albumen of the egg, &c.

"The sugar," says Lehmann, "which we meet with in the intestinal canal of herbivora and omnivora is due to the metamorphosing influence of saliva and pancreatic juice on starch and other carbo-hydrates; but we also find sugar in the blood of carnivorous animals in no very inconsiderable quantities; this must therefore have arisen from some other source than from the carbo-hydrates conveyed into the system from without; from a number of comparative analyses of the blood of the portal and of the hepatic veins, I believe, that I have indicated the probability that the sugar which is found in the liver, where it has also been found by Bernard and Frerichs, owes its origin to the decomposition of albuminates, and especially of fibrin."

When, further, we consider that nature has provided the egg with a small quantity of sugar, and that its amount varies according to the stage of development of the chick, the conviction forces itself upon us that the sugar, like the fats, is intended for some other purpose in the economy than merely to sustain the animal heat by its slow oxidation.

We are still far from being fully acquainted with the carbo-hydrates and the products of their conversion, which occur in the animal juices. Lehmann believes that we shall find indifferent substances similar to Scherer's inosite in the extractive matter. Our knowledge is more perfect regarding the acids which are formed in the animal body from the carbo-hydrates: formic and acetic acids have recently been found by Schottein, a very promising young chemist, in large quantities, in the sweat; butyric acid occurs, not only in the sweat, but also in the muscular fluid, in the parenchymatous juice of the unstriped muscular tissue of the stomach, the intestinal canal, and the urinary bladder; and lactic acid is found in the gastric juice as well as in most of the above-named fluids.

We regret that we cannot follow our author through his demonstration of the facts that the presence of small quantities of sugar essentially contributes to the solution and digestion of the protein-bodies, and that the carbo-hydrates, or rather their acid products of metamorphosis, discharge an important function in the intestinal canal, in no way directly connected with the process of respiration.—*Brit. and For. Medico-Chirurgical Review, January* 1853, *p.* 89.

129.—ON SCROFULA.

By Dr. M. A. Eason Wilkinson, Manchester.

[It is now pretty universally admitted that tuberculous and scrofulous diseases are identical, the susceptibility of the various organs at different periods of life accounting for the apparent difference in their choice and development. Dr. Wilkinson says:]

As most writers are now agreed that the great pathognomonic sign of scrofula is a deposit of tuberculous matter, it may be well to direct our attention for a moment to its description. Tubercles may be described as small tumours, varying in size from a small pin's head to that of an orange; they are round in form, and vary in colour from a semi-translucent hue to a yellowish white or greyish yellow. They may be easily crushed, like cheese, between the fingers, and present no organization of structure. Andral says that tubercles are in their first stage when they appear as minute, opaque, friable, rounded bodies, yellowish white in colour, and without any trace of vascularity. But this is not the only form in which they may commence; besides the yellowish miliary tubercles, we may have the grey semi-transparent granulations.

Microscopical observers differ very materially in their description of tubercle. At one time it was supposed that the tubercular deposit was not connected with cell formation, but that opinion has now become obsolete. All observers detect granular corpuscles, many of which are about the size of blood globules, and many are found to contain nuclei, and they are agreed upon the fact that these cells possess no developmental power.

Dalrymple is of opinion that scrofulous matter does not even possess the feeble power which induces the further change into pus, but that it

passes from the nucleolated cytoblast into an irregular granular body (disintegrated), the elements of which, by some further chemico-vital process, resolve partially into oil or fat globules.

[Early childhood is remarkably disposed to scrofula. In this period the absorbent glands are liable to become the seat of the disease. How is this? Perhaps an inquiry into the structure and function of these parts may assist us in explaining this fact.]

Mr. Goodsir is of opinion that the vasa inferentia on entering an absorbent gland, lay aside all but their internal coat and epithelium, and the latter, in place of forming a thin lining of flat transparent scales, as in the extra glandular lymphatics, acquires an opaque granular aspect, and is converted into a thick irregular layer of spherical nucleated corpuscles. The lymph or chyle is brought into close relationship with the blood in the absorbent glands, and there is little doubt that the epithelial corpuscles above alluded to, derive materials from the blood, which they elaborate as they grow, and which, when so elaborated, are discharged into the lymphatic vessels in the same way as in a secreting gland, the elaborated contents of the gland cells are discharged into the gland ducts. It is a known fact, that both the lymph and the chyle not only contain more corpuscles, but are more perfectly coagulable after they have passed the glands than before entering them. This fact would seem to confirm the opinion of physiologists now generally entertained, that the function of the lymphatic glands is, through the instrumentality of the corpuscles, to perfect the organization of the lymph or chyle as this fluid passes through them. There is an important distinction to be made between an absorbent gland and most other glands in the body. In the liver, kidneys, pancreas, and salivary glands, for example, the cells separate from the blood certain elements which they combine into a new fluid—the special secretion of each fluid—which fluid is diverted from the blood into the ducts of the gland; but the office of the cells in an absorbent gland is not to create a new fluid, but rather to perfect that fluid which flows through it. It is important to bear this in mind, because an absorbent gland may not only be vitiated by an impure blood, but it may also be deranged by an impure lymph; for, although the cells without doubt receive their increment of growth from the blood, yet it is certain that they are influenced for good or for evil by the quality of the lymph with which they are always in contact. Thus, the lymph which comes from a cancer does not excite the cells to healthy, but to diseased action. The function of the lymphatic glands which I have named, being granted, I submit that we should expect these little bodies to be in a state of erethism, so to speak, when nutrition, growth, and development are being most actively carried on, and we shall not, I think, be surprised to find, that these organs are very apt to fall into disease at this period.

The opinion long entertained by most physiologists, John Hunter amongst the rest, that the office of the lymphatic system is to take up and remove all the effete matter, which is to be cast out of the body, as no longer adapted to form part of it, and as inconvertible into any other useful product, is no longer entertained. The general opinion is,

that this office is performed by the blood-vessels, and, as the liquid contained in the lymphatics has all the characters of dilute liquor sanguinis, it seems reasonable to conclude that, so far from the absorbents taking up waste material, they merely select such organizable matter as can be appropriated to useful purposes in the animal economy. I cannot but think that this doctrine has been carried a little too far. It is an opinion now very prevalent, that the absorbents have nothing to do with ulceration, and yet we find in chancre that these vessels absorb the syphilitic virus, and the lymph so contaminated, excites syphilitic inflammation in the absorbent gland through which it flows. In the sore throat of scarlet fever, too, we are sure that something abnormal must have been absorbed by the lymphatics, for the glands in the neck often become quickly and enormously enlarged. In inflamed ulcers of the skin, too, how often do we find the absorbent glands become inflamed, although they may be situated at a distance from the ulcer. In malignant diseases, the *materies* of cancer is evidently absorbed; for instance, when you have secondary malignant disease in the lumbar glands from cancer of the testicle, or in the axillary glands from cancer of the breast.

The lymphatics have been found, with a few exceptions, in all the textures and organs which receive blood. It is with this system that scrofula is so intimately connected in early life. It is during this period that the vital and chemico-vital changes are most rapidly performed. The food is quickly digested; the blood rapidly circulates; nutrition, growth, and development, are most energetically carried on; the encephalon is being perfected in quality, and increasing in size; the whole muscular apparatus in the same way is rapidly advancing towards completion of development, requiring nutritious material, not only for its support, but for its progressive growth; the teeth are undergoing the greatest changes; and, when it is remembered that it is at this period we have the development of two sets, and that about the fifth year we have more teeth (48 in number) than at any other period of life, we may form some idea of the rapidity of action which these circumstances induce. These remarks might be extended to most of the viscera, but enough has been said to illustrate the point which I have advanced.

[Tubercle would not seem to be of inflammatory origin. It is much more probable that the mere irritation of the presence of tubercular matter may have excited an inflammatory action.]

When we consider that for nutrition or secretion to take place in any part, it is requisite that the part so nourished, or so secreting, should, not only itself be in a healthy state, but that the blood should also be healthy; and not only so, but that it must be regularly supplied to the part, and that there is yet another condition also essential, and that is a certain amount of nervous influence, and, so far as the absorbent glands are concerned, there is yet another condition requisite, and that is, that the lymph which flows them must also be healthy.

Now, should the cells which enter into the composition of these gland lose anything of their proper potentiality, or should the blood be unfit to nourish these cells, I think we can easily imagine that there should be an abnormal product, the result independent of all inflammation. And there is a fact which seems to confirm this opinion, that where the

scrofulous diathesis undeniably exists, you may have inflammation of a lymphatic gland, and yet that gland not undergo the scrofulous degeneration, as, for instance, when you have an inflamed inguinal gland from an ulcer on the toe.

Suppose we take it for granted that the office of the lymphatic glands is mainly to furnish white corpuscles, which, be it remembered, are insoluble, we may easily fancy that any interruption to their nutrition might furnish those little granular microscopic bodies which enter so largely into the composition of tubercle. It is admitted that in scrofulous glands we find structures that appear to be composed of the original cells of the glands, become thickened and opaque. I am strongly inclined to think that tubercles in the lungs are formed in precisely the same way, viz., by an imperfect development of the epithelial cells, which line the minutest ramifications of the air tubes and terminal vesicles. This imperfect development of the cells would no doubt put a stop to that exquisitely fine ciliary movement in those minute tubes and vesicles, which movement is essential to the onward progress of the secretion, and in consequence of this arrest of ciliary motion we can account, I think, for the incarceration of the tubercular matter in the pulmonary cells and minute air tubes.

[Does scrofula depend upon some primary morbid alteration of the blood? The result of various analyses have proved, that in scrofula we have diminution of blood globules and increase in the solids of the serum. The change of the blood advances in some measure concurrently with the disease. Dr. Wilkinson does not subscribe to the first part of this opinion, because he says there may not be scrofula although there may be chlorosis or anæmia. He fancies that its influence is exercised upon the nutrition, growth, and development of the cells of the absorbent glands. Dr. Wilkinson, in conclusion, repeats his belief that scrofula is not the result of inflammation.]—*Transactions Prov. Med. and Surg. Association, Vol.* 19, *p.* 51.

130.—ON THE TREATMENT OF NEURALGIA.

By Dr. Edwin Morris, Surgeon to the Spalding Union Infirmary, &c.

The treatment of neuralgia by *narcotic inoculation*, applied to the nerve, has been recorded in the 'Dublin Medical Press,' March, 1845. Two cases were successfully treated after this manner in the Meath County Hospital; the first was a case of severe frontal neuralgia; she had been bled, blistered, and had taken opium, without any benefit. "A solution of fifteen grains of acetate of morphia, dissolved in one drachm of creosote, was introduced to the supra-orbital nerve, and along the course of the temporal, malar, and buccal nerves, by four punctures of an instrument made for the purpose. In the space of a minute all pain (except that caused by the operation, which was very slight,) had ceased, and she slept better that night than she had done for months; after the interval of a week she had a slight return of pain in the gums of both upper and under jaw. The fluid was again introduced by two punctures made in the gum of each jaw, and the pain disappeared."

She left the hospital quite well. The other was a case of neuralgic sciatica. The fluid was introduced by one puncture behind the trochanter and one half way down the thigh; the pain was instantly relieved. A few days after, slight pain returning, the fluid was again introduced, and with the same good effects. The above cases are strong proofs in favour of the treatment; and I doubt not but that in some cases the treatment by inoculation of narcotics will be found beneficial; at any rate, in obstinate cases, I would strongly recommend the practice.

[*Blisters,* applied along the course of the painful nerve, are generally very valuable.]

When the pain is constant, and the parts tender upon pressure, the application of a blister will be advisable; should the pain continue after the application of a blister, the *endermic* use of morphia should be had recourse to. The raw surface of the blister should be sprinkled over with one of the following powders, every six hours, until the pain is relieved:— ℞. Morphia hydrochl., gr. j.; pulv. acaciæ, gr. xij. M. Fiat pulvis. In pulv. iv., dividendus. This plan will be found most beneficial in cases of acute sciatica, when applied immediately below and behind the great trochanter.

[*Acetic æther,* applied by means of a camel-hair brush over the affected nerve, is sometimes very useful. It may be repeated after a short interval. If applied too freely it will vesicate.]

Chloroform a few years since was quite unknown, but all practitioners are now so well acquainted with its virtues that to describe it more minutely would be superfluous. It has been used as a local remedy in neuralgia, and apparently with the best effects. The best way to apply it is by means of folds of lint, saturated with chloroform, which are to be placed upon the painful part, and covered over with oiled silk, so as to prevent evaporation. Great benefit has also occasionally arisen from the employment of an ointment composed of one drachm of chloroform to one ounce of lard, smeared over the painful nerve.—*Transactions Prov. Med. and Surg. Association, Vol.* 19, *p.* 29.

131.—ON THE EFFECTS OF LEAD UPON THE SYSTEM.

By Dr. James Alderson, F.R.S.

[The preliminary signs induced by the action of lead upon the system are more quickly perceptible after the poison has been taken in by the respiratory apparatus than by the digestive organs. The sign which first appears is a discolouration of the gums. Those parts nearest the teeth for one or two lines in length acquire a bluish, or grayish slate colour, other parts of the gums also become slightly tinged with blue. In some cases there is evident congestion and the slightest touch causes hemorrhage. The teeth, also, sometimes acquire a brown tinge and become brittle, though these are uncertain signs. The next sign is in the complexion; a transparent waxy tint being observable in the countenance,

giving an appearance of excessive delicacy. The next change is that the face becomes more emaciated than the rest of the body, and assumes an anxious and depressed expression. All these signs may continue for a long time and the workman may, though with impaired vigour, perform the duties of his calling. Before actual colic comes on, two new symptoms makes their appearance, viz., pain and constipation. Speaking of these Dr. Alderson says:]

These two symptoms—constipation and pain—are the most prominent characteristics of the disease. The pain is chiefly confined to the region of the umbilicus; it is of a twisting, grinding kind; by some it is described as communicating the sensation of tearing the bowls, and on this account it has obtained among the German miners the name of Hütten Katze, or cat of the foundry, descriptive of the torments which convey the sensation of the intestines being torn to pieces by a cat. By others it is described as a sort of constriction or compression, as if produced by a heavy weight on the abdomen: in this last case the pains are seldom so acute, but few intervals of ease are obtained.

The position of the patient during the paroxysm is worthy of notice. At one time he lies flat upon his face, and then rapidly changes his position; at another, he lies doubled up, with the legs bent upon the body; then rises suddenly, and walks, pressing the body with his hands, until a heavier paroxysm constrains him once again to seek relief in bed. The restlessness is excessive, and the whole attention of the patient is absorbed in what is passing within the abdomen. In the intervals of the severer paroxysm, there is merely a mitigation of pain, and not entire freedom from suffering. As a general rule, the violence of the pain is balanced by a more decided remission. It is difficult to explain on what these alternations of pain and comparative ease depend. It is remarked that the paroxysms occur more frequently during the night; and in this they assimilate with all nervous affections, in which a sense of the difficulty of obtaining assistance is an aggravating adjunct.

It is most important to observe one characteristic of the pain—viz. that it is not increased by pressure, but, on the contrary, is almost invariably relieved by it, at least when suitably applied. The patient's attitudes, and his own efforts to modify his pain by pressure, indicate the value of some mode of supplying it. If the abdomen be tapped by the hand or the pressure be made over a small space, the pain will be exacerbated; but if the whole hand, or both together be pressed over a large surface, and the force be applied gradually, a certain degree of relief will be experienced.

The constipation is usually in proportion to the pain; but varies much in different cases, and sometimes is the first symptom of the absorption of lead. Several days will frequently elapse without any evacuation, and without the individual feeling much inconvenience. The bowels, at first sluggish, part with their contents with difficulty and obstinacy.

The abdomen becomes retracted and drawn towards the spine, and the patient, as we have before noticed, seeks to assume a bent position of the body. This retracted, drawn condition of the abdomen, is more frequently to be observed in the chronic cases.

On examination by the hand the parietes are found hard and resisting, and the tension of the muscles is not relaxed even when the knees are drawn up, and the attention of the patient is purposely diverted. Andral gives a case in which a tumour of the abdomen was stimulated by this contracted state of the muscles, and in which, after the subsiding of the pain, the abdomen resumed the natural pliability.

It is not unusual to find tenesmus. The French and German authors are minute, I think, to an unnecessary and therefore reprehensible extent in their observations of the state of the rectum, during the paroxysm of pain, which they describe, after examination, as being in a state of alternate contraction and relaxation.

Nausea, accompanied by eructations, is a frequent symptom, and it is succeeded by vomiting, which is effected with difficulty, and with much apparent suffering; it usually follows a violent paroxysm of pain. The secretion from the kidneys is diminished in quantity and often passed with difficulty; the perspiration, indeed, being the only secretion which is not interfered with. The intellect throughout the disease remains unimpaired, but the spirits fail and are depressed, so that when the attack has been of long duration without relief, the courage to endure sinks in a remarkable degree, and despair takes full possession of the mind.

During convalescence there are frequent returns of constipation, even after full action of the bowels has been obtained, and the pain recurs and lingers. When at length the constipation and the pain have been entirely relieved, there is yet another distressing symptom to be noticed, in the want of sleep. On recovery, dyspepsia is suffered from, with all its usual train of discomforts, amongst which the most prominent is flatulence.—*Lancet, July* 31, 1852, *p.* 95.

[Dr. Alderson introduces a few philosophical considerations as to the cause of lead at one time producing colic, and at another paralysis.]

The water-gilder in metals is employed in a highly pernicious process, on account of the fumes of mercury to which he is constantly exposed while at work. It is not necessary to detain you by detailing the process; but the pernicious part of it consists in the volatilization by heat of the mercury, which is disengaged from an amalgam of mercury and gold at the time when the gold is deposited on the metal. The paralysis to which these artisans are subject differs entirely from that which affects the workers in lead. Mercurial tremblings are known to arise from the absorption into the blood of the fumes of mercury during respiration. They come on gradually, with an incapacity to direct the arms and hands; and this want of power to direct, increases to shaking, and then to trembling, and in time other parts of the body participate.

Now, we have all seen mercury given to its full constitutional effect, as evidenced by ulceration of the gums and complete salivation, and yet we have no record that I am aware of, of mercury taken by the mouth having produced these tremblings. As far as we know at present, it would appear that it is requisite that mercury should be received into the blood by absorption through the lungs in the act of respiration, in order to occasion these tremblings. The inquiry, then, naturally sug-

gests itself, whether any similar results may attend the same mode of absorption of lead. As far as the making of litharge and of minium is concerned, there can be no doubt of the fact, that the metal is in precisely the same state as the mercury, passing off probably in the form of oxide, volatilized by heat; and these fumes are similarly received into the blood through the fine membrane of the air-cells by endosmosic action—that is, both the metals are volatilized by heat, and both similarly offered to the lungs during the process of respiration; but in the case of the carbonate, which is floating in the atmosphere, as dust in manufactory, or diffused in combination with a volatile substance, as turpentine, it may appear that there is some difficulty in reconciling the circumstances, since the carbonate of lead is an insoluble salt. But so also are the carbonates of magnesia and soda, and lime and iron; and yet under certain circumstances an extra equivalent of carbonic acid may be given to each of these preparations, and with only a slight change of property the carbonates (now probably become bicarbonates or supercarbonates) are rendered soluble. The clear solution of magnesia, as it is called, is an instance of the change. The solution has acquired a slightly bitter taste, but the magnesia is dissolved. Soda-water contains soda in the state of supercarbonate; carbonate of lime takes on the same state in nature, and in this way contributes to that beautiful process by which plants are enabled to be nourished through the endosmosic action of their spongioles. Further, I may observe that it is consequence of the lime being in this state, with excess of carbonic acid, and *in solution*, that Dr. Clark has invented his process, by which water, rendered hard by this supercarbonate of lime, may be made soft for domestic purposes. It is done thus: to this solution of the bicarbonate of lime he adds the hydrate in definite proportion, which, combining with the equivalent of carbonic acid in excess, causes nearly the whole to be precipitated in the form of the common insoluble carbonate. Iron in all chalybeate waters is probably in the same condition.

The only difficulty now seems to consist in our being able to trace the source of the extra equivalent of carbonic acid to make the carbonate of lead floating in the atmosphere soluble as a bicarbonate. Now, free carbonic acid is constantly being given off by the lungs in respiration; and when we remember that these very minute emanations are presented to the air-cells at the very time when this living stream of free carbonic acid, *in a nascent state*, is being separated from the venous blood, can we doubt, under all the circumstances of the parity of symptoms produced by mercury, that such change may take place—viz., that the carbonate of lead may become soluble, and be received into the blood.

Thus, then, as we have seen that mercurial paralysis is produced by absorption of the volatilized mercury through the lungs, so from analogy, I believe that the paralysis of lead, in its acute form, is the consequence of the absorption of *that* metal through the lungs also, whether in the state of fumes or of carbonate: colic being the acute result of the reception of the metal through the alimentary canal, which may or may not be followed by a chronic form of paralysis, from the subsequent more intimate absorption of the metal.

I have great reason for believing that the acute form of paralysis,

produced by inhalation, differs in character from the chronic form which follows colic, and arises from the reception of lead in any form through the medium of the alimentary canal, as in poisoned water and other casual modes of introduction.

Though lead colic is an acute disease, the treatment may be pursued without much doubtful anxiety as to the ultimate result. Unlike the painful uncertainty which accompanies our measures to combat with diseases of inflammatory type, there is here every assurance of a successful issue, and if it be a first attack, and uncomplicated with paralysis—even though the symptoms be in excess severe—there is every probability that speedy relief will be afforded. In La Charité, an empirical practice has been followed for many years, which, according to all the French authorities, has been attended with much success. It consists merely in an extension of what was the practice of the ancients, as laid down by Nicander and Celsus, who prescribed vomiting and purging as the treatment for poisoning by lead, as well as by other metals.

We now proceed to reason from our own views of the nature and seat of the disease. Although we are ready to admit that the whole digestive canal is at times involved, we cannot doubt that the specific seat of colic is in the large intestine. Nausea and vomiting frequently occur, but they are only accompaniments of the peculiar feature of the disease, the *pain in the abdomen,* and the *constipation;* and hence it is that, in this country, emetics have been less freely used, but those remedies have rather been resorted to which are known, from experience, to relieve the one and to remove the other. The great desideratum, therefore, has been, to choose the most certain, and, at the same time, the least distressing purgatives, the action of which is comparatively less interfered with by a combination with opiates. There are other adjunctive measures used with a view to assist in removing the poison, of which I shall speak hereafter.

As far as we can judge from the imperfect data we possess in this country, there is no reason to believe that our treatment is less successful than that of our neighbours. Calomel alone, or in combination with the compound extract of colocynth of our pharmacopœia, and with opium, is the aperient which may most safely be relied on in all stages—even during sickness; not, however, omitting to guard against the probability of the constitutional effect taking place, and superseding the purgative. The combination of croton-oil prevents such result, by accelerating the action; and as all remedies have their specific effect upon different portions of the canal, we secure our object better by combination. Whenever the above combination has failed to succeed, we have still a resource in the use of croton-oil in full dose. Its action in this disease is speedy and safe: a couple of hours scarcely elapses without satisfactory result.

This remedy is now used in France; and Tanquerel, though he has lauded the practice of La Charité, is so free from prejudice, that he has adopted it very extensively. I must remark, while adverting to this author, on the singularity that, after a lapse of thirteen years since his publication, the 'Edinburgh Journal' has just brought it into prominent notice by an able review. It is possibly unfortunate for the interest of

these lectures, which rested mainly on the freshness of the subject, that this review has appeared since I began to prepare them. I regret this on account of those who have the trouble of listening to me. But to return.

Castor-oil is a favourite remedy in self-treatment at the manufactories, and, no doubt, is of the greatest value in the earlier symptoms. The women, who are more careful of self-management than the men, have frequent recourse to it in the beginning of indisposition, and in this way perhaps obtain that protection which has been attributed to other causes. Castor-oil may alleviate by its solvent as well as by its aperient power,—lead being miscible with oil; such particles as are delayed in the intestinal canal, ready for future absorption, may be taken up by the oil and carried away.

The warm bath has been much used in this country. It was observed. as long ago as by the first Dr. Warren, that while the patient was in the bath he was free from pain, but that on emerging the suffering returned. Dr. John Wilson thought he obtained more speedy relief by giving injections of large volumes of warm water while the patient was in the bath, with a view, as he states, of "evacuating the morbid secretions of the intestines."

The bath is now used with the sulphide of potassium, in the proportion of four ounces to thirty gallons; and Dr. Pereira finds this bath highly effectual in relieving even acute cases. The skin becomes immediately blackened from the formation of the sulphide of lead, and even after several baths and ablutions with soap. On emerging from the bath, the axilla, the abdomen, the inside of the thighs, the palms of the hands, the back, and all parts where hair is found, are the localities of the peculiar chemical change.

It may not be altogether useless to consider the mode in which the sulphide bath may operate beneficially; for it may possibly have occurred to others, as it has to myself, that the specific effect is not so unanswerably certain as some of the highest authorities believe. It is probable that a double current would be set up by endosmosic action proportioned to some power of the density of the fluids in the cellular tissue and in the bath, which will be favoured by the soddening effect of the bath itself, and thus the comparatively inert sulphide of lead will be formed; but if we examine the localities of the chemical change, we find those of the sebaceous glands and hair follicles are the principal; and this would rather lead us to believe that much of the discoloration is to be attributed to the mechanical entanglement presented to the carbonate by the hairs and the peculiar unctuous secretion at their base. The observations, however, of Dr. De Mussy are important in support of the opinion that the lead found in the surface is exuded from the pores, after having been taken into the system with the food, since he describes the abdomen of one of his patients as having become entirely black; and the case was one in which there could have been no possibility of exposure to emanations so as to have rendered a surface accumulation a tenable supposition.

The pains which we have described as occurring in the limbs, and which are considered by the French (erroneously, as we think) to be a

separate disease, are to be relieved by the use of the bath; opiates are also indispensable, as the increase of distress during the night renders sleep otherwise unattainable. A more difficult subject for discussion now lies before us in the cure of *paralysis from lead.* In this form of the disease, the change of colour, the impaired muscular power, and the wasting of the paralyzed muscles, demonstrate that there is an almost broken constitution to deal with, and one which would fail to endure the trial of very active measures. In colic we find an apparent wasting of the solids, especially indicated in the shrinking of the features; but this seeming emaciation is so soon recovered from, the form so rapidly restored to its usual proportions, and the complexion to a more natural hue, that it cannot but be regarded as merely illusory. In paralysis, however, there is not a seeming, but a real change in the structure of the muscles. There is actual emaciation, and it is one of the symptoms from which, when appearing in excess, we should draw the most unfavourable conclusions as to the prospect of final recovery, for here, indeed, the altered and impoverished condition of the blood is distinctly manifest.

After paralysis has commenced, the immediate removal from the poisonous influence is the first necessary step, without which all plans of treatment would be useless. After removal, such acute cases as have resulted upon a short exposure will be easily restored. The chronic form, however, especially when frequent attacks of colic have preceded, is much more difficult to manage. It is obvious that the first step must be to free the nervous and muscular tissue from the offending cause, and action on the whole digestive canal should be induced and followed up, in a mode as little calculated as possible to depress the already debilitated powers of the patient. The bath (the sulphide bath) is here again useful. Some who are well versed in physics, and who know their value in the treatment of disease, have proposed the use of electricity in these cases, and not without good reason and apparent success. Dr. Golding Bird has noticed the subject in the 'Guy's Hospital Reports' for 1841. Of the two forms—galvanism and electricity—he prefers the latter, from its higher state of tension, and employs it in the form of sparks. In amaurosis there is no doubt, I think, that the electrical form is to be preferred, because the stimulus is capable of immediate application to the conjunctiva by means of the brush; but in paralysis of the extremities I should incline to prefer the galvanic form, because we can perceive and reason on its mode of action upon the immediate cause of the disease. The low state of intensity and the large amount of chemical power which especially characterize galvanism render it an instrument of great power and value; and I should propose to apply it thus:—Our positive metal we may consider to be the lead in the nerves and muscles and tissues, and our negative metal, plates of copper, which we must attach to the limb itself; a weak solution of acetic acid may form the oxidating and connecting link. I choose acetic acid, because the acetate of lead is soluble, and there is every ground for reasoning that the chemical and galvanic actions set up will cause the lead to be withdrawn from the muscles.

It is usual to give tonics, and in a safe form there can be no doubt of their general efficacy, but of the class of alkaloids, such as strychnia, we

must admit that the danger of their use hardly excuses such experimental treatment without the greatest caution. My own recollection of the reputed success of the use of strychnia many years ago, in France, coupled with my knowledge at the same time that these reports were unsupported by real evidence, makes me very dubious of later statements on this subject.

The compositor, who, in addition to other hardships, has often to labour through the night, and seek what rest he may during the hours of sunshine, is a frequent subject of paralysis, but he is rarely attacked by colic. The types, which are composed of a metal having lead for its basis, are obliged to be frequently washed, to free them from the ink, and are sometimes placed before a fire to dry. The ink is composed of linseed-oil and lamp-black, thinned by turpentine. Lead is soluble in oil, and diffusible by turpentine, and heat assists the diffusion. The handling also favours the diffusion, and in a certain degree offers opportunity for absorption by contact with the sentient extremities of the fingers, a part which perhaps is as vulnerable as any external surface covered by epidermis. I am myself disposed to think that the reception of the poison is mainly attributable to respiration, else how can we account for the amaurosis which is not unfrequently found among compositors? It is obvious that portions may be inhaled in the process of cleaning just alluded to. The compositor is too often also of intemperate habits, and the vapour from the lungs, being charged with spirit, diffuses the lead more easily, and favours the absorption.

The plumber and the potter are both exposed to the influence of lead: the former, not only from handling the metal, but also from emanations during the process of soldering. The solder, composed of equal parts of tin and lead, is applied by heat, in combination with resin, which is the residue of the distillation of turpentine. This is another instance of the influence of turpentine assisting the action of lead on the human frame. Two processes involving lead are carried on by the potter: one consists in dipping the biscuit-ware into the glaze, which is a solution of litharge; and another is the burning in. They are performed by different workmen, and it is those who apply the heat that suffer.

The glass-maker may be classed with the potter: lead, in the form of silicate, passes off with the heat used to favour the manipulations.

The sealing-wax makers, who formerly suffered from mercurial tremblings only, from the use of cinnabar to colour the wax, now suffer, in addition, from the use of lead. The introduction of new colours, as white and yellow, has included the carbonate and the chromate of lead in the manufacture.

A size containing litharge is used in glazing visiting-cards, from which the workmen occasionally suffer. The invention, at best, is but a clumsy one, as the cards lose their whiteness on exposure to hydro-sulphuric acid. For the same reason I should argue that cosmetics never could have been composed of lead, notwithstanding that the French insist upon the fact. It seems hardly likely that it should retain its colour in the vitiated atmosphere of crowded rooms, abounding in hydro-sulphuric acid. The same observation does not apply to the hair-dye, which is perhaps included in what they call cosmetics; for the more hydro-

sulphuric acid, the deeper the tint, which is the desideratum.—*Lancet, Sept.* 4, 1852, *p.* 212.

[The following extract is taken from a review of the works of Dr. Alderson and Mr. James Bower Harrison. It is an interesting inquiry as to what is the amount of impregnation with lead which renders water dangerous. Mr. Herapath has seen injurious effects produced when the water contained only one part in 500,000. Dr. Smith, of Aberdeen, believes that 1-20th of a grain of lead in one gallon of water, or one part in 1,400,000 parts of water, will not produce injury; and that the limit of danger is somewhere between the 1-10th and 1-20th of a grain to the gallon. Dr. Dyce, another Aberdeen physician, also gives similar evidence. Both Dr. Alderson and Mr. Harrison, however, afford different testimony. Soft water readily attacks lead, forming the hydrated oxide of the metal. Water dissolves a large portion of this, and on carbonic acid uniting with it, the insoluble carbonate is precipitated; an excess of carbonic acid, however, so as to convert it into a bi-carbonate, renders it again soluble.]

Suppose, however, that the quantity of carbonic acid present is just sufficient to convert the whole of the oxide into an insoluble carbonate; this gradually falls as an impalpable powder to the bottom of the cistern, whence it is very likely to be stirred up by every fresh supply of water, and thus carried forwards into the service-pipes. So that, whether dissolved as the hydrated oxide or the bicarbonate, or suspended as the insoluble carbonate, it is liable to gain admission into the human body, and thus to produce incalculable mischief.

"There is another instance," says Dr. Alderson, "in which the presence of lead, under apparently similar circumstances, may be found to vary. Water running in leaden pipes, or pumped from a leaden pump, *may* show no trace of the metal; but after a delay of twelve hours or more in the pipes, or in the body of the pump, which very often happens, the water will be found to contain it in smaller or greater degree. As an illustration of this, I quote from Dr. Clark's published evidence in the report of the General Board of Health, on the supply in Aberdeen:—'The water is brought from the iron mains in the streets to the houses by means of leaden pipes, and in general without any disadvantage, because the supply from the pipes is constant, and the use of the stop-cock very frequent in a family; but in my class-rooms and laboratory, I find that when the pipe has been out of use for a few days, the water taken from it affords a trace of lead, which disappears when the water has been allowed to run briskly from the stop-cock for a few minutes.' It is curious that Dr. Clark is an Aberdeen M.D., and is thus describing the identical water which is spoken of in the 'Report of the Chemical Commissioners' as perfectly innocuous."

Dr. Christison has shown that the same thing is true of Edinburgh water, which may be kept running over the lead with impunity, though it cannot be left standing in the metal for any length of time without becoming charged with it; and the Board of Health have with much candour acknowledged, that in their opinion "minor injuries from such partial contaminations may occur, and pass unnoticed."—*Brit. and For. Medico-Chirurgical Review, April* 1853, *p.* 322.

132.—CASE OF LEAD POISONING.

By Dr. Edward Murphy, of New Harmony, Indiana.

[It is important to observe, that many cases of lead-poisoning seem to arise from the water used in the preparation of soda water, and thus supplied by public companies. Mr. R., merchant, aged 42, temperate, and hitherto very healthy, was attacked in February with intermitting abdominal pain, and obstinate constipation, which was treated as peritonitis. The constipation only yielded in several days after large doses of medicine. Being attacked in March while at Louisville, with the same symptoms, he was attended there by a distinguished physician, who pronounced the disease abdominal neuralgia, and treated it accordingly. Dr. Murphy continues:]

"From that time up to 22nd February, 1846, he has been suffering, almost constantly, with excessive pain in his abdomen, radiating from thence to all parts of his body, often of very great severity; obstinate constipation of his bowels, accompanied often with nausea and vomiting (the patient attributing the nausea and vomiting to the *very* large doses of opium which he was sometimes obliged to take); was frequently confined to his bed; he lost flesh and strength, notwithstanding a constant good appetite, and had a bloated, though anemic, countenance. He had very much the appearance of a person in cachexia from malignant disease. There was a dirty yellow colour of the skin, with a yellow discoloration of the albuginea oculi, simulating jaundice the whole time. Sometime during this period, he became affected with slight paralysis of the extensor muscles of the fingers of the right hand, with the exception of the index, which rendered him unable to write; his vision became imperfect; there was great mental prostration, approaching hypocondriasis,—indeed, he was totally unable to do business throughout the greater part of this period, from mental imbecility, sometimes being unable to perform the minutest calculation, or to attend his customers, who generally considered him insane; was very irritable the whole time.

"About this time, Mr. R. was attacked with what was thought to be apoplectic fits, having had four or or five, and on the 24th I was called in consultation. He was confined to his bed, very pale and feeble; sensible, although very weak in mind; would give an answer in relation to his case, and immediately forgot that he had done so; sometimes became alarmed at persons present, and again was much terrified at absent imaginary enemies, who were conspiring against him—a state resembling delirium tremens; speech, faltering and hesitating; sight defective. His face was frequently affected with choreic convulsions, when he would complain of severe shooting pains through his body, and of which he was in constant dread; tongue, soft and broad; pulse, feeble, but almost natural as respects frequency; bowels, constipated; stomach, very irritable; chest perfectly sound; sounds and rhythm of the heart natural; nothing unusual in the appearance of his urine; although very feeble, would sit up for a short time when desired. Considering it impossible that an individual should have four or five fits of apoplexy in two or three days, without any lesion to the brain, or symptoms denoting such, and on carefully interrogating his family—the

physician in attendance not having seen him in a fit—I made out his attacks to be of an epileptiform character, being preceded by the horrid scream of epileptics, accompanied with evident convulsions,. I advised opening the bowels by active purgatives, opiates, nourishing diet, blister to the nuchæ, and sulph. quinia, when the bowels were well opened, and took my leave, after assuring his family that I did not consider his present attack to be apoplexy, but probably a part of his old complaint, and gave an unfavourable prognosis.

"Mr. R. remained in nearly the same state, but without another fit, until the third of March, when I was again called in and associated in the treatment of his case. By persistence in the above remedies, to which was added wine and brandy, he very gradually recovered to his late state of health. When so far recovered as to be able to sit up, his defective vision became almost complete amaurosis, which continued some time, then gradually disappeared, but was not entirely recovered from; the patient was fully of the opinion that it was caused by the quinia he had been taking, although never more than six grains in the twenty-four hours, and with no idiosyncrasy to its action. There was also, at this time, increased paralysis of the right hand, the left also becoming slightly paralyzed.

"From the 16th of March, at which my attendance ceased, up to January, 1847, when he placed himself in my hands for treatment of fistula of the anus, complicated with fissure, he continued to have the same attacks, of greater or less severity, with only short intervals of repose, being nearly worn out with constant suffering and bad health. As opium was his only relief, he generally prescribed for himself throughout the lengthened period of his sickness, except when his attack was unusually severe. After the cure of his fistula, his disease returned with greater severity, and of a more alarming appearance than ever.

"On the 10th of June, in the absence of his regular physician, I was again consulted. Mr. R. was confined to his chamber and almost to his bed, the mere wreck of his former self, and scarcely able to sit up, weeping from excruciating pain, and in such a state of mind as to express a wish to commit suicide, and indeed he was afraid he should do so. His face, pale and wan, was marked by the deepest despair, from extreme suffering, imploring me strongly for relief; wrists entirely dropped, from complete paralysis—being perfectly helpless, and unable to straighten either hand, unless by the aid of the opposite arm, and requiring all the care of an infant, in being fed, washed, &c., yet a comparatively good grip with his hands. His extremities were dwindled away to the mere sheaths of the muscles; his abdomen seemed to be the centre, as usual, from which his pain radiated, and it was with the greatest difficulty that I could persuade him, after a careful examination, of the non-existence of organic disease there. The slightest touch of the skin over the umbilicus, and indeed over other parts of the body, produced such terrific pain as almost to throw him into convulsions, producing all the effects of an electric shock; while the greatest pressure over the same place gave him no uneasiness, but rather relief: his bowels were always constipated, unless moved by medicine. Was the constipation produced by the large quantity of opium which was taken, or did it depend on

paralysis of the muscular tunic of the intestines? There was sometimes vomiting of a greenish watery fluid; tongue flat and broad; pulse very feeble, and more frequent than natural; his cachectic appearance was that of a person in the last stage of malignant disease; appetite comparatively good; his suffering was much more intense during the night than the day, unless relieved by excessively large doses of opium. From the balls of both thumbs, which were much atrophied, excruciating pains would arise, shooting with great severity up his arms and shoulders, to the back of his neck and head; the shoulders were affected with constant pain, especially the deltoid muscles, which also were slightly paralyzed. The pain in his lower extremities was also very severe, commencing in the soles of his feet, which were so sore that he dreaded to touch the floor with them, and shooting up the limbs to the lumbar region with dreadful suffering. There was also at this time a new source of suffering—shooting pain through his testicles, of such severity as almost to produce fainting; indeed, to see him in his suffering, was the most heart-rending sight I ever witnessed, and I was greatly astonished to see how any human being could so long survive so much and such constant misery.

"I stated to Mr. R., which I had done several times before, though not when attending him, that he presented in the strongest light all the symptoms of poisoning with lead, and had it been possible that he could in any manner have been exposed to its influence, I should have no hesitation in attributing all his sufferings and bad health to that cause: but Mr. R. was a merchant, and in no way liable to be acted upon by lead, or any of its salts, in his business. There were no lead pipes or utensils used about the house; nor had he taken it in any form as medicine during his whole life. The autumn before the commencement of his sickness, he built a new store and repaired his house, which were painted in the usual manner; and this was the only exposure to the influence of lead to which he could refer. I, however, considered that this could not be the cause in itself, as I thought it impossible that its influence could have extended over a period of nearly four years.

"His case seemed perfectly hopeless, and I firmly believed he would never leave his chamber again alive. As all the remedies recommended for neuralgia had been exhausted without any benefit, and as he had taken so much medicine from time to time, that his stomach gave way almost at the bare mention of it, I felt very much at a loss what to advise. I, however, advised Mr. R. to submit to an alterative course of mercury, as a last resort; giving him to understand that I considered neuralgia, convulsions, and various anomalous affections, might depend upon a cachectic state of the body, from some poison either taken into or generated within it, and preventing its proper nutrition, and which might be controlled or removed by a course of mercury, as constitutional syphilis and malaria often were; at any rate, it was possible it might produce a new action in his system. This he dreaded very much, and offered a great many objections, which I removed; but he declined for the present.

"June 17.—To-day Mr. R. consented to take mercury. I gave him a one-grain blue pill, four times a-day, with an occasional aperient, and continued the opium to relieve his sufferings. I applied blisters over

various parts of his spine, which increased his pain so much, that I was obliged to heal them directly. This treatment was continued about three weeks, with an occasional rubbing-in of mercurial ointment over his abdomen, when a considerable improvement was manifest. Treatment continued.

"July 15.—Was summoned to Mr. R., when I expected another unfavourable turn in his disease had taken place, but was agreeably disappointed in finding him much relieved and improving, and down stairs. The statement which I had before repeatedly made to him, that he presented all the phenomena of poisoning with lead, made a very strong impression on his mind, so much so, that it constantly occupied his mind, and just brought to his recollection that he had been in the habit, for many years, of chewing lead, and that this habit extended so far back that he was unable to date its commencement. Formerly, being very fond of his gun, he frequently took hunting excursions, on which occasions he always had a piece of bullet or shot in his mouth; when in the store, he seldom ever passed by the box containing the shot without putting some in his mouth to chew. But what he most liked, from its agreeable taste, and of which he chewed a great deal, was the lead lining of tea-boxes; besides he considered that the pressure of the teeth on the metal enabled him the better to bear his pain. I immediately replied, that the cause of all his sufferings and bad health was perfectly clear, and at once assured him that he might yet be a sound man. I at once examined his gums, for Dr. Burton's symptom, and found the blue line over four or five teeth. I considered the case fairly made out, and never felt so much rejoiced as at that moment, to think that an individual, after such a prolonged period of suffering and bad health, whom all considered as beyond recovery, and almost in the grave, should by this discovery, be yet restored to health and usefulness. Not so my patient, however; he was very sceptical of my prognosis, not conceiving it possible that his disease could have originated from what to him appeared so slight a cause. I assured him that his case always appeared a very strange one to me, and I was always astonished to think that a healthy individual, as he had always been, should have been reduced to such a protracted state of bad health, without any organic disease, unless from some evident cause, which had, at last been discovered; that it was now rendered almost certain, that his first attack—which was considered acute peritonitis—and many subsequent ones, were attacks of lead colic. Further, that his attack of autumnal fever, from which I date the commencement of his disease, had probably produced a debilitated state of the body, rendering it more susceptible to the influence of minute portions of the metal. Also, that nearly every symptom which writers have laid down as indicating poisoning with lead, had in this case been repeatedly and severely manifested; and the only reason why he did not before recover, was the continued renewal of the poison whenever he was present where it could be obtained. Also, that we were now in a fair way of proving it; the cause being discovered, would in future be avoided, and he would continue well. I pointed to the present amelioration of his disease from the treatment he was pursuing, as a favourable indication that it depended on some removable cause, as

idiopathic neuralgia of such long standing was seldom benefited by any treatment. From all this, it will be seen that I had to urge a number of reasons to convince my patient of the real nature of his case, but without convincing him. I added acid sulph. aromat. to the former remedies, and by the 1st of August his pains had nearly entirely subsided, his bowels were acting naturally, and he left off medicine, even opium, for the first time since the commencement of his sickness. I ordered splints to his wrists and hands, which gradually recovered their natural state.

"Mr. R. entirely recovered his health in every respect, and has continued well up to the present time (February, 1850), being again a *strong, active* business man. *He thinks* that the extensor muscles of his wrists and fingers are not *quite* so strong as before his disease commenced; which is probably true, as muscles which have long been inactive require frequent and strong exercise to recover their proper tone, which cannot be given to these muscles; their function being merely extension, they cannot be exercised to any extent: however, the defect is very slight indeed.

"*Remarks.*—1st. In consulting all the authorities within my reach, I have not found a single case having any resemblance to this; yet nearly every symptom described by the various authors I have consulted as belonging to or arising from poisoning with lead, with the exception of apoplexy, which generally terminates the case in death, were all combined in this case, and fully manifested. Indeed, this case would in *itself* afford all the materials for a complete history of the toxicological effects of lead on the human system. It also shows that the effects are the same, whether produced by the metal itself, or its various salts; probably the former is converted into one of the latter, in all instances, before it is absorbed into the system. Further, I think it may be reasonably inferred, from this case, that lead is a cumulative poison; and when once the body has been brought under its influence, very minute quantities are sufficient to keep up its effects. Also, that although the effects of poisoning with lead are very distressing, yet it cannot be considered as very dangerous to life, even when long continued in small quantities.

"2nd. We have here additional evidence of the effects of a latent poison, either taken into or generated within the body, in producing and keeping up neuralgia, convulsions, cachexia, mental imbecility, paralysis, amaurosis, &c., showing the necessity of tracing these affections, and various other anomalous phenomena, to causes of this nature, in many instances.

"3rd. The beneficial influence of mercury in controlling the effects, or removing latent poisons from the body, was strikingly manifested in this case. In consequence of the low state of the patient, I did not like to venture on a larger dose than the one given, believing it to be more advantageous to introduce the medicine gradually, than to produce a sudden or violent effect, which I considered would only add to his danger. Now, in inflammation the case is different; this process being certain to damage the part in which it is located, or to destroy life if not checked, we wish to have the influence of the medicine on the system as

soon as it can be produced, where the case demands it. It was really curious to see how symptom after symptom gradually gave way from day to day, the patient gaining flesh and strength, and yet the only sensible effect of the medicine ascertainable was an indistinct mercurial fetor of the breath once or twice.

"4th. This case is very instructive in another point of view,—*the great necessity in all cases of tracing diseases to their causes;* exemplifying the old adage, 'that knowing the disease is half its cure;' for it was only by the frequent repetition that his case resembled the effects of lead on the body, that the patient was brought to the recollection of his almost fatal habit.

"5th. As the great drawback to the progress of the science of medicine is the almost universal tendency amongst its cultivators to draw sweeping generalizations from a single or a few cases, I shall close this too lengthy paper before I indulge *too much* that way; yet a great many beautiful illustrations of disease, and useful reflections, might, in my opinion, be drawn from this single case. I, however, venture to think that no one, in reading the history of this case, its happy termination in perfect and robust health, the patient continuing so up to the present time, can for a moment doubt but that all the extreme suffering and disease before mentioned were rightly attributed to the cause assigned."—*Western Lancet, July*, 1850. (pp. 273-280)—*Brit. and For. Medico-Chirurgical Review, Oct.* 1852, *p.* 344.

133.—ON THE EMPLOYMENT OF IODIDE OF POTASSIUM AS A REMEDY FOR THE AFFECTIONS CAUSED BY LEAD AND MERCURY.

By M. Melsens. Translated by Dr. William Budd, Physician to the Bristol Royal Infirmary.

[The great practical value of the paper under consideration will become readily apparent to all our readers. From the investigations of M. Melsens, it would appear to be established "that iodide of potassium is not only a radical cure for saturnine and mercurial poisoning, but equally sure in preventing the injurious effects produced by emanations from lead and mercury." The bearing of these facts upon the therapeutic use of these agents, need scarcely be alluded to. The following is the mode in which M. Melsens supposes this salt exerts its curative powers:]

In all cases of mercurial and saturnine poisoning, he assumes, and no doubt rightly, that the metallic substance is in actual union with the affected part or parts, and is retained there in the form of some *insoluble* compound.

According to his view, the iodide of potassium, after its absorption into the blood, combines with the metallic poison, and forms with it a new and *soluble* salt—liberates the poison from its union with the injured part—dissolves it out, so to speak, from the damaged fibre, and sets it once more afloat in the circulation.

The new compound thus set at liberty (under the form, it is presumed,

of a double iodide of mercury and potassium) he supposes to be eliminated through the kidney almost as soon as formed, in combination with any excess of iodide of potassium that may happen to be present. So that, both poison and remedy being cast out together, the cure may be said in a peculiar sense to be radical and complete.

[From cases under his observation, Dr. Budd had been led to the same conclusion. He relates a case of a man who was admitted into the Bristol Royal Infirmary three years ago, with secondary syphilis. Previous to his admission, he had taken mercury freely, *but none after entering the hospital.*]

The day after he came in, he was put under treatment by iodide of potassium in pretty free doses. My surprise was great on coming to the hospital a few days afterwards to find my patient profusely salivated. The swollen face, the peculiar state of the tongue, the loosened teeth, the ulcerated mouth, and the characteristic fetor, were all present. For many years I had not seen a severer case of mercurial ptyalism. And yet this man, as I specially ascertained—for I at first thought there might have been some mistake—had not taken a grain of mercury since his admission.

Under these circumstances, I came to the conclusion that a portion of the mercury administered some months before had become fixed in the body, and that the liberation of this mercury under the solvent influence of the iodide of potassium was the cause of the severe salivation under which the patient was now labouring. No other theory of the case, in fact, seemed admissible. It may be interesting to mention, that under a continuance of the iodide, not only the syphilitic affection soon got better, but the paralysis also was almost entirely removed.

Since the occurrence of this case, I have seen many others of exactly the same kind, in which mercurial ptyalism came on during the use of iodide of potassium, in persons who had taken mercury some weeks or months before, but none within a more recent period. On several occasions, indeed, the facts have been so striking, that I have been led to make them the subject of clinical remark. A very interesting example of it is under my eye at the present time, in which the same result, in a milder degree, has appeared to be produced by the free inunction of compound iodine ointment. The lady who is the subject of the ptyalism, took a mild course of mercury about ten weeks ago, but was not then sensibly affected by it.

[The following are the chief practical heads of M. Melsens' work:]

The kidneys are the principal outlet of the iodide of potassium. It is even with extreme difficulty that this salt can be made to pass through the bowels into the stools.

Every mercurial compound which can possibly occur in the living economy, even metallic mercury itself, is soluble in iodide of potassium; the presence of the organic substances of the body does not hinder these reactions.

Neither sulphuric acid, nor sulphates, can serve as antidotes to slow

poisoning by the salts or compounds of lead, the sulphate of lead being itself a slow but sure poison capable of killing vigorous dogs in twenty or thirty days.

[In support of this assertion, M. Melsens remarks that the evidence commonly adduced is not sufficient to prove sulphuric acid to be an antidote to slow lead poisoning, although sulphate of magnesia may be properly given in cases of poisoning by a soluble salt of lead to act on the portion yet unabsorbed. Sulphate of lead, however, may be, and probably is, less readily absorbed than other compounds; but that sulphuric acid will reach lead already deposited in the system is quite unproved. Moreover, sulphate of lead is itself a poison, as can be shown by experiments on dogs, some of which are detailed. One dog was paralyzed on the eleventh day after 108 grains of the pure sulphate had been given; he then refused food, and died epileptiform, emaciated, and in a state approaching scurvy on the 22nd. Another dog took 293 grains, and died on the 28th day, with similar symptoms.—*Translator.*]

Cure of gilders, and of workers in quicksilver.

The first patient subjected to the treatment was an old man at Bicêtre, whose case has been recorded with full details by M. Guillot. He had been a gilder, and had lost the use of his limbs by the exercise of his calling. His sight was gone, and he was, moreover, tormented by violent and constant pains. Iodide of potassium was administered every day, in the dose of 61 grains (four grammes). At the end of a fortnight's treatment he left the infirmary alone and without help, whereas on his admission he was obliged to be brought in a litter.

2. I saw a gilder in mercury, about twenty-five years old, treated by the iodide of potassium during three weeks. At the end of that time he could write with ease, whereas at the beginning it was perfectly impossible for him to write at all.

3. The only person on whom the iodide of potassium did not act with energy was an old man of seventy, a working gilder. He was only treated during a few days for a strong salivation; the treatment was given up.

Barthelemy Pichon was a working gilder. His memory was very feeble; his speech much embarrassed; and the tremors were so violent, that he could only be employed in the coarser operations of water or galvanic gilding. He belonged to the factory of M. Christofle.

In the beginning of 1844 he was six weeks at the Hôtel Dieu, but with small result. The 1st of June, 1844, I let him have 3087 grains (200 grammes) of iodide of potassium in solution, recommending him to begin by taking a portion corresponding to 15 grains (one gramme) of the salt daily, increasing the quantity as he liked; guiding himself by the severity of his pains, and diminishing the dose when these pains should become too severe. After a few days' treatment he was seized with pains in the head and stomach, and had pimples over the body,—symptoms which did not, however, prevent him from working constantly during the seventy days that his treatment lasted, and that were taken up in consuming the 3087 grains (200 grammes) of iodide of potassium. He followed his ordinary regimen, and changed his habits in nothing.

After the treatment, Pichon was completely cured. He wrote without shaking; he spoke glibly. According to the report of M. l'Eté, this workman, who before his treatment was unable to execute any but the coarsest works belonging to gilding on metal, after seventy days treatment executed the most delicate processes. There was intense headache on one occasion during his treatment, but this was in sequel to a debauch, after which he had taken no medicine for three or four days. In order to recover the lost time, he took at one draught a dose which should have been distributed over several days. Immediately after this dose the pain in the head was so agonizing that he thought he should have gone mad.

5. A looking-glass maker, employed in one of the Brussels manufactories, put himself under treatment by iodide of potassium. Before he became a gilder, he had been a typographer. He trembled to such a degree as often to drop everything he held in his hand; his speech was slightly embarrassed; his legs supported him ill; he often made false steps; his strength failed him almost entirely. Three hundred and eight grains (20 grammes) of iodide of potassium, taken in ten days, scarcely affected him. As he belonged to a provident society of operative typographers, the medical attendant of the society desired, before continuing the iodide of potassium, to subject him to other treatment. He was of opinion that trembling of another character might complicate the mercurial trembling. A month afterwards he sent his patient back to me in exactly the same state as before. He was again placed under treatment by the iodide. Although this artizan had left his trade, the amendment following the treatment was very slow. He told me, nevertheless, that he felt his strength return daily; the tremors gradually disappeared. It was not, however, until he had taken 3087 grains (200 grammes) of iodide that the amendment was very marked. He scarcely trembled at all, his step was firm, his handwriting good; but his strength had not entirely returned. Observing that the cure in this patient was progressive, but slow, in spite of his withdrawal from his workshop, I ordered iodide of potassium to be used in frictions, under the form of iodine ointment. It was especially from this time that the recovery of strength became perceptible. It was not until towards the end of August, after three months' treatment, that he had entirely recovered.

I saw this workman again in the beginning of the month of November. He told me that his health and strength were much as they had been before he began the business of a looking-glass maker. In the month of April, 1849, he was perfectly well, and nothing remained of his old complaint.

This man only remained proof against the pernicious influence of the trade twenty-one months. Having entered the manufactory in March, 1846 the trembling came on in January, 1848. In questioning him in the presence of many of his comrades I made this observation, which appears to me important:—Those workmen who are fond of salt resist the contamination longer than those who are not.

6. An operative in the same factory was affected with a trembling, which embarrassed him much in his work. His limbs were exceedingly weak; the slightest effort fatigued him. Sometimes objects dropped

from his hands: his gait was insecure. His tremors were already of old standing: a year before, he was ill enough to keep his bed, and although relieved then, he remained weak after the treatment which was adopted.

From the 21st of March, 1848, to the 7th of May, he took 771 grains (50 grammes) of iodide of potassium. During the whole of this time he continued to work at silvering, as before, and, what is more important, his work in contact with mercury had almost doubled in the number of hours. Nevertheless, on the 7th of May the tremors were almost reduced to nothing. He took afterwards, up to the 22nd of June, about 1543 grains (100 grammes) of iodide of potassium. He often interrupted the salt for two or three days, taking it according to his own judgment, the severity of his pains being his guide. The 4th of September he was perfectly well; trembled little or not at all, and continued his calling without any recourse to medicine. During the whole of this time he never ceased to work, and was always in contact with the poison. His cure was accomplished without preventing him from gaining his livelihood and maintaining his family, and without any change in his regimen or habits.

[The following experiments show that the iodide of potassium renders medical treatment in poisoning by certain salts of mercury more active, and may occasion serious accident.]

For a long time past (from the year 1838-39 at least) M. Dumas has enjoined in his lectures, the importance of abstaining from common salt when calomel is given, and is desired to remain in the state of calomel in the digestive tube. He has recommended, on the contrary, the addition of sal-ammoniac to corrosive sublimate, in order to render it more stable and less easy to be decomposed when in contact with the fluids of the system. The work of M. Mialhe is sufficiently well-known for me to content myself with a simple reference to it. If the same doses of calomel are given to two dogs, and to one iodide of potassium is given at the same time, the dog which takes the iodide will be destroyed first if the doses of the two salts are at all large. In a comparative experiment made on two dogs, chosen of the same age and strength, as near as may be, I obtained the following results. The first took seven grains (0·500 gramme) of calomel in all, and about one drachm (four grammes) of iodide of potassium administered in the following manner:—

1st day.—Rather more than three grains (0·200 gramme) of calomel and 30 grains (two grammes) of iodide of potassium.

2nd day.—Nothing.

3rd day.—Rather more than four grains of calomel (0·300 gramme) and 30 grains (two grammes) of iodide of potassium.

He died in the night of the fifth day. The same doses of calomel without the iodide scarcely affected the second dog at all. On the day of the death of the former he still took about one and a half grain (0·100 gramme) of calomel. He was then let alone for seven days. Nearly two and a half grains (0·150 gramme) of calomel did not prevent him from living five days longer. He had taken, therefore, twice as much calomel as the first dog, and had lived twelve days longer. He suffered, however, a good deal. I gave him at one dose as much calomel as was taken

by the first in three days—namely, nearly eight grains (0·500 gramme), and on the morrow 30 grains (two grammes) of iodide of potassium. The symptoms grew worse; he died forty-eight hours afterwards, without any fresh administration of either calomel or iodide.

[The last selection we shall make is upon the treatment of the secondary and tertiary disorders of syphilis. M. Melsens says:]

The administration of iodide of potassium often causes intense suffering in patients who have been treated by mercurials. To what are these phenomena to be ascribed? According to the opinions put forth in this essay, it is at once seen that when, in consecutive disorders of this class, iodide of potassium is given to individuals who have been treated by mercurial compounds, two distinct effects are produced by a single agent; first, the compounds of mercury fixed in the body are rendered soluble and active; and secondly, a form is given to them which allows their (rapid) elimination. But by the very fact, the patient is subjected anew to a mercurial treatment by the compounds of mercury already present in the body.

If in the treatment of secondary syphilis iodide of potassium acts on its own account—a fact which I do not dispute—we must not, nevertheless, leave out of view the properties to which I have here desired to draw attention, for they must, without doubt, play an important part in the case. There ought to be a marked difference between the action of iodide of potassium on an individual free from mercurial compounds, and on one who holds mercurial compounds in his tissues. It results from the facts established in this memoir, taken as a whole,—whether they concern protection from poisoning, the aggravation of it even unto death, or finally, the cure of those already poisoned,—that with the treatment by iodide of potassium the cure is never obtained except by a preliminary poisoning—poisoning which the physician has completely the power to regulate according to the strength of the patient. It suffices for this to begin by administering the iodide in a small dose, as M. Guillot and I proposed as long as six years ago. For a man, it is well to begin with fifteen grains (one gramme) a day, increasing the dose if the patient bear it well. It seems to me that inferences of some importance to medicine may be drawn from the facts contained in this memoir. Indeed, the constant aggravation of the symptoms of poisoning upon the administration of iodide of potassium in excess, and the elimination of the poison in a state of combination with one of the elements of the iodide, authorize us in saying that certain medicines act in the first instance on their own account; but may act at the same time by the agency of the materials they meet with in the living body. It is the duty of the physician, therefore, to inquire into the prior history of the patient, even more perhaps than physicians are in the habit of doing, when he is desirous of administering remedies having an action analogous to that of iodide of potassium to individuals formerly subjected to the influence of saturnine or mercurial compounds.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 201.

134.—ON CONCUSSION OF THE BRAIN.

By Dr. R. C. Williams.

[In a review of the works of Mr. Fergusson and Mr. Miller, by Dr. R. C. Williams, this gentleman states, that neither of the above-mentioned surgeons have defined the *real* nature of concussion of the brain. This has been more especially done by two French surgeons, who, however, have omitted all reference to the previous definition of our own eminent countryman, Dr. Bright. Dr. Williams says:]

Two eminent French surgeons, M. Nélaton, in his 'Elements of Surgical Pathology,' and M. Desnonvilliers, in the 'Compendium of Surgery,' commenced conjointly with the late M. A. Berard, and, since his lamented death, continued along with M. Gosselin, have each given an account of certain morbid appearances observed after death from concussion of the brain. M. Nélaton, it will be observed, attributes to Sanson the merit of having first pointed out the appearances described in the following extract:

"Sanson, who had a predilection for studying every question relating to injuries of the head, was the first to indicate an alteration of the substance of the brain, which he drew our attention to several times. The alteration in question consists in minute extravasations of blood, as large as the heads of small pins, disseminated in the substance of the brain. Since our attention was directed to this fact, we have discovered, under similar circumstances, these small miliary extravasations, which might be confounded, were we not upon our guard, with minute drops of blood presenting at the orifices of the vessels when a slice of brain is cut away. But that mistake is easily avoided; for in the first case the minute clot of blood can be removed with the point of the knife, while in the second it is fluid blood that presents at the extremity of the vessel; and, moreover, it is possible to remove the little speck of blood and cause it to reappear several times in succession at the same point, by gently compressing the substance of the brain. It requires, no doubt, great care to always discover so slight a lesion; yet it will seldom escape observation, if we have the patience to first remove the pia mater and then pare away the brain in very thin slices. These extravasations of blood are found at the periphery and towards the centre of the brain; they occur equally at the point percussed and at points adjacent to it, and at others more or less remote. The small extravasations are sometimes numerous, sometimes few, and but five or six of them may be disseminated throughout the brain." (Nélaton, t. ii., p. 575.)

M. Nélaton then goes on to observe, that the alteration above described constantly exists in contusion of the brain also, and he thence infers that *concussion* must be regarded as a slight degree of *contusion*—an inference not warranted by the premises, as the appearance in question only shows, at the utmost, that blood-vessels are ruptured in both cases; and finally, M. Nélaton says, it by no means follows that the minute extravasations of blood above described are present in every case of concussion of the brain, because it is quite conceivable that a shock may suffice to rupture some of the cerebral fibres, without being sufficiently energetic to rupture the blood-vessels also, and the opportunity of exam-

ining the brain only occurs in fatal cases of the accident, in which the severer shock capable of rupturing the blood-vessels has been inflicted. The second volume of M. Nélaton's work was published in 1849, and we do not know any earlier notice of Sanson's having made the observation, respecting the condition of the brain in concussion, attributed to him by M. Nélaton. There is no allusion to the subject in the 'Nouveaux Elements de Pathologie Med. Chirurg.,' by Roche and Sanson, in which the latter writer expressly treats of injuries of the head.

In the 'Compendium of Surgery,' by MM. Desnonvilliers and Gosselin, two fatal cases of concussion of the brain, with the *post-mortem* appearances, are recorded. The first of these cases was communicated by M. Bayard to M. Desnonvilliers, and is peculiarly interesting, because it adds another to the extremely few cases in which any account is given of the condition of the brain, where death occurred very soon after the accident; and in which, consequently, the appearances cannot be referred to changes produced by consecutive complications. The circumstances under which the injury was inflicted, were almost identical with those in Littré's celebrated case. A man, aged twenty-three, was arrested in the suburbs of Paris, and having threatened to commit suicide, was confined in a cell with his hands tied behind his back; when left alone, he dashed his head violently against the wall, fell senseless, and died in about *three quarters of an hour*. On dissection there was no fracture of the skull, no extravasation of blood, either between the dura mater and the bone, or on the surface or in the substance of the brain. Neither was there any contusion or laceration of that organ. The brain, moreover, presented its natural consistence; but throughout its substance were interspersed small specks of blood, and, on gently compressing the sliced brain between the fingers, fluid blood exuded from the vessels. In the second case death occurred *eight hours* after a fall from a considerable height. Several complications, however, existed in this case. There was fracture of the cranium with depression, and slight laceration of the brain at one point, with slight contusion of the organ at the point diametrically opposite, but no blood was extravasated, either on the surface or in the substance of the brain. On slicing the brain, however, appearances similar to those seen in the preceding case were discovered.

M. Desnonvilliers admits the accuracy of the account given by Littré, of the condition of the brain, in the well-known case recorded by that writer; and he thence concludes, that when concussion of the brain is immediately fatal, the only cognizable alteration is a contraction or shrinking of the organ; with that point, however, we are not at present concerned. But M. Desnonvilliers further infers, from the two cases of which an outline has been given above, that when the patient lives for some time, the anatomical characters of concussion consist in congestion of the vessels of the brain. And when the patient survives the affection, he thinks it may be fairly assumed that the organic changes are the same in kind but less in degree.

We need not stop to point out the differences between the anatomical characters described by M. Nélaton, and by M. Desnonvilliers; but it will be seen that Dr. Bright's account of the appearances observed after con-

cussion of the brain, embodies those that are given by both the French writers; one of whom he anticipated by eighteen, and the other by twenty years.

We have not space to quote as fully from Dr. Bright as we could desire; but it is, perhaps, enough to say, that in his 'Reports of Medical Cases, &c.,' vol. ii., part 1, 1831, Dr. Bright describes at page 408 the "small clots from laceration . . . . . of the size of large pin-heads." occupying "the internal part of the brain," &c., and that at page 410 he writes as follows:

"What then is the immediate state of the brain producing the symptoms of concussion? Of this we can only judge from the nature of the injury traceable after death. . . . . and almost the only appearances which can be considered peculiar are the minute lacerations of the brain and vessels, which occur both upon the surface and deep in the substance of the brain; and we are led to conclude that the violence done to the brain, if it does not always go the length of producing these appearances, has at least such a tendency, and that it is this rupture of the brain, or an approach to it, with some consequent congestion in the vessels, which gives rise to the peculiar symptoms of concussion."

And a little further on Dr. Bright comes to the conclusion, which harmonizes so well with practical experience, that "a process of repair" —a "mode of healing,"—is required for the cure of concussion, probably "analogous to the repair of apoplectic injuries, requiring therefore much time, and calling for great caution in the management of the invalid for a long period after the first symptoms."

The condition of the brain in concussion requires, no doubt, further investigation; but the existing evidence, so far as it goes, strongly tends to show the connexion between concussion of the brain and the morbid changes above mentioned; and if further researches establish that connexion more completely, the merit of having first elucidated one of the most obscure and debated points in surgical pathology, will certainly belong to Dr. Bright. It is scarcely necessary to remark how much more satisfactorily all the phenomena of concussion can be understood by tracing them to the physical alterations indicated by Dr. Bright, than by the vague expedient of referring them to "functional derangement." It will probably, also, be admitted, that M. Gama's experimental illustration of the mode of production of concussion of the brain, quite accords with the appearances that have been observed in fatal cases.—*Brit. and For. Medico-Chirurgical Review, Jan.* 1853, *p.* 66.

135.—ON ELECTIVE ELIMINATION BY THE SALIVARY AND OTHER SECRETIONS.

By M. Cl. Bernard.

In this paper Mr. Bernard calls attention to the fact, that some of the secretions rapidly eliminate certain substances, while other substances, equally soluble, are either eliminated much more slowly, or not at all. He relates the results of a series of experiments, in which iodide of

potassium, iodide of iron, lactate of iron, cane and grape sugar, and yellow prussiate of potass, were injected into the veins, and the various secretions then tested for their presence.

Of these, *iodide of potassium* appeared, at latest, in from 30 to 40 seconds in the saliva, and was also rapidly observed in the tears and pancreatic juice. It required more than an hour to become detectible in the urine or the bile; and if injected in very small quantities, was not found in these at all. Introduced into the stomach, and especially fasting, it was found in the saliva in 1½ minute. The *yellow prussiate of potass* was not discernible in the saliva, while in seven minutes it was found in the urine and abundantly eliminated; the serum of the blood also exhibiting a notable quantity in an hour and a half. It was also found in the bile, while, although it was thus circulating in the blood, no traces of it could be found in the pancreatic juice. *Grape and cane sugar* never passed into the saliva or pancreatic fluid, while it was manifested in the bile and urine, though less rapidly than the prussiate. As various authors state they have detected sugar in the saliva in *diabetes*, the author examined that of several such patients under M. Rayer's care. In none was sugar detected, although the bronchial mucus and sputa evidently contained it. The *mammary gland*, which in the normal state contains the sugar of milk in its secretion, refused passage to grape or cane sugar, even when these substances existed in large quantities in the the blood. A saturated solution of *lactate of iron*, thrown into the veins, never gives rise to iron in the saliva; but when the iron is injected as an *iodide*, it obtains admission into the saliva, both the iron and the iodine being then detectible.

This expulsion of certain salts by this or that secretion, is not the only peculiarity the history of elimination presents. Some substances are eliminated rapidly and completely, while others remain within the tissues for a more or less long period. It is well known that certain of these, as mercury, antimony, and arsenic, become localized in certain organs—*e. g.*, the liver—and are then gradually eliminated: but it has not been noted that others, as the iodide of potassium, which are perfectly soluble, and remain soluble in the economy, wherein they circulate without enduring any accident, may remain for a certain time in the substance of the organs. Two or three weeks after iodide of potassium had been introduced into the stomach of several dogs, and long after its supposed entire elimination by the urine, in which it had ceased to appear, it was found in the saliva and gastric juice. If, however, purgatives were employed after administering the iodine, it ceased to be detectible in a few days in any of the secretions.—*Archives Générales*, N. S., vol. i. p. 5.—*British and Foreign Medico-Chirurgical Review, April*, 1853, *p.* 558.

136.—*On the Administration of Phosphorus.* By Dr. R. M. Glover.—It has long been a desideratum in medicine to find some safe mode of administering phosphorus. At first I supposed that this would be attained in the new amorphous phosphorus; but from experiments on animals, I find this substance to be without either the deleterious or the active physio-

logical properties of the ordinary substance. I have given phosphorus lately in the following ways: first, in the form of a solution in chloroform; secondly, in cod-liver oil. Chloroform dissolves about one-fourth of its weight of phosphorus; and the solution is not inflammable. I have given four or five minims of this solution, shaken up with a drachm of ether in a wineglassful of port wine, twice a-day, with great benefit in rallying the forces of the patient, as I fancied at least, in cases of typhoid fever. The solution in the oil is made by cutting the phosphorus into chips, and putting it into a bottle of the oil, in the proportion of half a grain to the ounce, then immersing the bottle in hot water, and, with a a little shaking, solution is easily effected. I think I have seen this beneficial in strumous cases.—*Lancet, Jan.* 8, 1853, *p.* 34.

137.—*Hyposulphite of Soda and Silver.* By M. Delioux.—M. Delioux (Bull. de Thérap., xliii. pp. 289, 401) states that two years' trial of this substance at the Marine Hospital at Rochefort, leads him to the conclusion, that in some cases it may advantageously be substituted for the nitrate, as a much milder preparation. It is formed by pouring a solution of hyposulphite of soda over oxide of silver, recently precipitated by potass, until the oxide is entirely dissolved. Evaporation furnishes minute crystals of the hyposulphite of soda and silver, which are dried in a mild heat, sheltered from light. It is insoluble in alcohol, and very soluble in water, the solution being more slowly decomposed by light than that of the nitrate. Kept away from the light, its transparency may be indefinitely preserved. When quite pure, it does not discolour the epidermis or linen. It is less astringent and irritating than the nitrate, and may in several cases thus be advantageously substituted for it. It is especially in urethral discharges it has been found useful, solutions of one or two parts to thirty of water exciting less irritation than solutions of the nitrate of half the strength. He, however, usually employs it only in the proportion of half to one part to the 100 of water. He has not used it internally.—*Brit. and For. Medico-Chirurgical Review, April* 1853, *p.* 567.

138.—ON MEDICAL METEOROLOGY.

By Dr. T. Moffat.

For some years I have kept a register of daily observations of the barometer and other meteorological instruments, the amount of atmospheric ozone, and the dates of the commencement of diseases, as they occurred; and from what I have observed, I readily concur with the opinion of Dr. Addison, as stated in his article on 'Requirements in Meteorological Tables,' that the changes of the weather are prejudicial to health, and that mean readings of meteorological instruments do not show the connexion between the prevalence of diseases and atmospheric conditions. I feel confident that meteorological tables cannot be of any value, in a medical sense, unless they are formed of daily observations,

and include the date of commencement of individual diseases; for even a slight increase or decrease in the readings of the barometer, with a change in the direction of the wind, leads to an increase in the number of cases, or to their entire removal. I have observed that the following diseases, —viz., apoplexy, epilepsy, infantile convulsions, and sudden deaths, premature labour, menorrhagia, uterine pains, diarrhœa with sickness, and with or without cramps, toothache, neuralgia, &c.,—seldom occur without decrease of the readings of the barometer and changes of weather; that snow and hail-showers are, all but invariably, accompanied by seizures of apoplexy, epilepsy, and sudden deaths; and that ozone never appears without a decrease in the readings of the barometer, and that its presence or absence in the air depends entirely on the direction of the wind.

Of the number of cases of apoplexy which occurred in the years 1850 and 1851, fifty per cent. took place on days of decreasing readings of the barometer, and fifty per cent. happened on days after such readings; one hundred per cent. occurred with fall of temperature, and they all took place with a direction of wind from the S.E. and S.W. points of the compass. Of the cases of epilepsy in the same years, sixty-nine per cent. occurred with decreasing readings of the barometer, and ninety-eight per cent. took place with decreasing readings of the thermometer. Of the cases of toothache, ninety per cent. commenced with fall of the barometer, and seventy per cent. with fall of temperature. Eighteen out of twenty-three cases of premature labour occurred with decreasing readings of the barometer, and either a reappearance or an increase in quantity of ozone. Of seven sudden deaths, five occurred with wind from N.W. with hail showers. All the diseases above enumerated observe a similar rate of per centage, to similar readings of the barometer and thermometer. Directions of the wind appear to influence the prevalence of certain diseases; for all the cases of rheumatism which came under my notice in the same years, commenced with directions of the wind from southern, north-western, and intermediate points; as also did all the cases of bronchitis and pleurisy. All the cases of infantile convulsions commenced with the wind in the W. and N.W. points. All the cases of erysipelas took place with a wind from N. and S. and intermediate points, by way of W.; while toothache and neuralgia occurred with the wind from all points of the compass; but these two last diseases, diarrhœa, and some others, are *invariably followed by a decrease in the readings of the barometer, and a change in the direction of the wind.*

The following may be viewed as a type of a meteorological process, and of the class of diseases which accompany it:—If the wind continue from the northern points of the compass, that is, from points between N.W. and S.E. by way of E., the barometer readings will remain high, there will be few or no cases of disease, and no ozone; but if the wind passes into southern points, that is, to points from N.W. to S.E. by way of W., the readings of the barometer will decrease, there will be toothache, neuralgia, and diarrhœa, &c.; there will be ozone, and general changes in the weather; and when any of these diseases occur, *when the wind is in the northern points,* they are a certain indication that decreasing read-

ings of the barometer will follow in a few hours, and ozone will be detected, or not, just as the northern or southern current prevails.

These conclusions are the result of close and uninterrupted observations during four years.—*Association Med. Journal, Feb.* 11, 1853, *p.* 129.

139.—*Recent Uses of the Ammonio-sulphate of Copper.*—At the Westminster Hospital, Dr. Hamilton Roe has recently employed this salt very successfully in the treatment of a series of cases of severe *chorea*, the patients being mostly children under fourteen years of age. In several the sulphate of zinc and sesqui-chloride of iron had been tried previously, and without benefit. The dose given has been from half a grain to a grain three times daily. Its use in this complaint is not novel, although not much resorted to in this country. In Italy it has gained a considerable reputation, and is known by the name of the "Specific of Stissero." Mr. Startin has for some time been accustomed to prescribe a long continued course of the ammoniated copper in malignant diseases, and seemingly with some good results. Its action is probably that of a tonic. In several cases the health of the patient has appeared to improve very perceptibly. *Scirrhus* of the breast and *cancroid ulcers* of the skin are the forms in which it has principally been tried. The dose has ranged from the eighth to a quarter of a grain three times daily, and has often been continued for many months. We believe it has been employed for nearly similar purposes in veterinary medicine.—*Med. Times and Gazette, Jan.* 1, 1853, *p.* 23.

140.—POISONING BY LAUDANUM IN AN INFANT; EFFECTS OF GALVANISM.

By George Kirk, Esq., Middlesbro-on-Tees.

[On the evening of the 24th of December, Mr. Kirk was summoned to an infant, one month old, labouring under all the symptoms of narcotic poisoning. The husband confessed to have given it six or seven drops of laudanum. Mr. Kirk says:]

I immediately got some tartrate of antimony wine, but found there was a total inability to swallow, and that no attempts could be produced by irritating the tongue and fauces; coma appeared rapidly increasing. By this time the breathing was only occasional and apparently with great difficulty, face deadly pale, and pulsation of heart very indistinct; I expected that in a very short time death would close the scene. Recollecting that I had some time since seen reported in 'The Lancet,' that galvanism had been successfully applied in a case of poisoning from an over-dose of opium, I at once decided upon giving it a trial in this case; and having got the battery into action as soon as possible, I applied one of the conductors over the epigastrium, and taking the other conductor in my right hand, I passed one of the fingers of my left hand into the mouth of the child between the teeth and gums, and as far back towards the fauces as I conveniently could—the battery acting with the

lowest intensity I could produce (having nearly withdrawn the bundle of wire from the centre of the coil). I found the breathing almost immediately become regular; the action of the heart also increased, and was natural so long as I kept up contact. After continuing the action continuously for nearly half an hour, I suspended the action of the battery by withdrawing my finger from the mouth, when the breathing gradually decreased, and it was apparently subsiding into the same state as previous to the commencement of the galvanic action. Observing this, I again introduced my finger as before, when the respiration again became natural; and after continuing it about an hour longer, I was enabled to make the child swallow some tartrate of antimony wine. The action of the battery being again withdrawn, the respiration went on natural for a greater length of time, but again began gradually to sink into its former state; again renewing the communication of the battery as before, in a little time the child vomited. Stimulated by the success, I continued the galvanic action, occasionally withdrawing the stimulus for short periods. I continued for upwards of four hours, as after each successive application the child appeared to improve. Finally, the breathing and circulation seemed completely established; and the child being able to swallow a little coffee, I ordered a tea-spoonful of castor-oil to be given every three hours until such times as the bowels were acted upon freely. The child continued ailing for a day or two, but has ultimately recovered, and is doing well.—*Lancet, Jan.* 22, 1853, *p.* 80.

141.—THERAPEUTIC USES OF THE BARK, LEAVES, SEEDS, AND ROOT OF THE COMMON ASH.

[In a work published by Dr. Otterbourg last year, the leaves of the common ash are highly spoken of as a remedy in *gout and rheumatism.* In the same year two French physicians Drs. Pouget and Peyraud published a paper confirming the same observation. The case of Dr. Peyraud himself will illustrate the effects and mode of administration of the plant better perhaps than that of any other detailed.]

In 1842, Dr. Peyraud had his first attack of gout, which was severe, and lasted for twenty-five days. During the three following years, the attacks increased in frequency and severity. Having derived little benefit from the remedial means which he had resorted to, he listened to the suggestions of one of his patients, an inhabitant of the department of Dordogne in France, who advised him to try an infusion of ash leaves, informing him, at the same time, that his forefathers had been cured by this prescription, and that many of the country people got rid of "their pains" by employing it. Dr. Peyraud took the infusion of ash leaves, and from 1845 to 1849 had no fit of gout. He then had an attack, which yielded in five days to the infusion of ash leaves, used under the observation of Dr. Pouget. These circumstances recalled to the recollection of Dr. Pouget a fact which he might otherwise never again have considered. It was this,—that when he was a physician at Sorèze, in 1824, the peasants of that place had spoken to him of the great power

which an infusion of ash leaves had in driving away pains. He afterwards discovered that it had been used forty years ago as a gout specific by the peasants of Auvergne.

A commercial traveller, who had been gouty for twenty years, and had saturated himself with the syrup of Boubée and other vaunted specifics, consulted Dr. Pouget. At this time he was an almost constant prisoner in his room with successive attacks. After eleven days' use of the infusion, he was able to walk two *kilomètres* (one and a quarter English mile); in fifteen days he resumed his journeys, and was able to travel without suffering, by diligence, from Bourdeaux to Quimper.

Several other cases are detailed, some of them acute, and others chronic. Articular rheumatism, in numerous instances, was also benefitted by the infusion of ash leaves.

Drs. Pouget and Peyraud thus sum up their opinions as to its efficacy and mode of administration:

"The powder (infused) of ash leaves is perhaps a true specific for gout and rheumatism, combining with the most powerful curative action, the immense advantage of giving rise to no dangers nor inconveniences, such as result from the use of colchicum. Having no purgative properties, it may be taken in any condition of the digestive canal. It causes neither nausea, sickness, general discomfort, nor depression. Experience enables us to state, that generally, under its use, at the end of four or five days, and sometimes sooner, the pain, redness, and swelling have sensibly diminished in intensity, or have even disappeared."

The method of administration is thus minutely described.

1. Each dose of the powdered leaves ought to be infused for three hours in boiling water.

2. Before this infusion is taken, it requires to be sweetened to taste, and strained through a linen cloth.

3. In acute gout, and especially at the commencement of the attack (whether with or without fever), two doses of the powder ought to be infused in three cups of water; one to be taken at bed time; the second, early in the morning; and the third, between breakfast and dinner. The medicine in diminished doses, requires to be continued for eight days after the symptoms have disappeared.

4. In chronic gout, a cup of infusion ought to be taken night and morning, for a long period. Fits of gout may be more or less indefinitely postponed by having recourse to this treatment, say for 8 or 10 days in every month.

5. In acute rheumatism, the infusion greatly assists the action of other medicines which are commonly used; and it is particularly beneficial in removing articular swellings. It produces equally good results in chronic rheumatism, whether articular, muscular, or nervous.

6. During the use of the remedy, it is not necessary in any way to change the mode of living, nor to adopt any special regimen, so long as the laws of sound hygienics are observed.

Speaking of the dose and method of administration, Dr. Otterbourg says: "Several times during the day, thirty-two grammes of ash leaves may be taken, infused in a sufficient quantity of hot water. In muscular pains, and in rheumatism of the scalp, this is an excellent means of cure.—*Association Med. Journal, Jan.* 7, 1853, *p.* 17.

142.—GUACO, AN ANTIDOTE TO SERPENT BITES; ITS USE IN RHEUMATISM, SCIATICA, DEAFNESS, &c.

By Dr. E. W. Pritchard, (late R. N.), Hunmanby, Scarborough.

[In a letter to the editor of the 'Medical Times and Gazette,' Dr. Pritchard bears his testimony to the efficacy of a plant named Guaco, a species of Aristolochia, much used by the natives of Central Africa, as a remedy for these wounds. He says],

Dr. Duvon exhibits it in the form of tincture thus:—

℞. Guaco powdered, ℥ij.; spirit. ten. Oj. Mix., digest for eight days in gentle heat, and filter. Dose, ʒj. to ʒiij.

The part bitten to be well rubbed with the tincture, or the stem of the plant, as may be at hand. During my sojourn in South America, hearing of its reputed effects, I prepared a tincture as directed, and soon after had an excellent opportunity of testing its virtues in the case of a seaman wounded by a scorpion, when alarming symptoms manifested themselves. The injured limb was instantly rubbed with the application, and ʒj. doses given every ten minutes, and with marked benefit, the patient expressing himself relieved after each dose, and he eventually recovered. I am not aware of this medicine being much used in this country, but since being in private practice, I have used it in chronic rheumatism and sciatica, in ecchymosis and sprains, also in some forms of deafness, with unerring success.—*Med. Times and Gazette, Nov.* 20, 1852, *p.* 522.

[In a subsequent letter, Dr. Pritchard, in answer to an enquiry, says, that the true guaco plant is named the "Mikania Guaco," classed by Dr. Lindley under the "Aristolochiaceæ." He adds,]

I can bear indisputable evidence of its utility as a tonic. When on board Her Majesty's frigate, Calypso, returning from the Gulf of California and Coast of Mexico, many of the crew were attacked with bilious remittent fever, and during the stage of convalescence, when languor is almost a second disease, the exhibition of the guaco was found most magical in its effects. Having fallen a victim myself, I freely confess, when I began to take it, my appetite and sleep soon returned, while quinine gave headache, and increased the thirst and restlessness.

Subsequently it was administered in cases of chronic dysentery with speedy benefit. Dr. Dwoon, of "Quayaquelle," found it a useful "sialogogue" in syphilitic affections of the gums, as a dentrifice in spongy gums, in chronic rheumatism, and sciatic pains; in cases where atonic action of the tonsils exists; he used it in all cases of doubtful wounds; bites of insects, applied externally; also in ecchymosis and sprains; and extols its virtues as invaluable.

The success which has attended its use in the cure of atonic deafness, especially that which appears in the post-meridian of life, will be best seen by presenting you with a few cases from my note-book.

Mrs. V., aged 56, consulted me in the month of June, 1851, complaining of being dull of hearing for the last ten years, which she attributes to the period of change. The cerumen was properly secreted, and the organ appeared perfect. It was only by shouting close to the head she could

be made to understand; any very sudden noise or report produced a whizzing sensation, which completely confused all her ideas.

Previously to seeking my advice, she had been under some very eminent aurist, without receiving relief: stated that syringing always made her quite incognizant of sound. Her general health seemed good, with the exception of suffering occasionally from severe constipation. Catheterism of the Eustachian tube had been tried, and vapours passed through that channel to the ear, but with the same result as injecting into the external meatus.

Five drops of the tinct. guaco was dropped into the right ear, and secured by a small plug of gutta percha, the latter having a coating of collodion painted over it.

A pill of rhubarb and aloes was ordered every day after dinner; and three drachms of tinct. guaco, in six ounces of distilled water, for a mixture. Two tablespoonfuls three times a day.

Four days afterwards the plug was removed, and cotton wool, dipped in the guaco, substituted; the left ear was then plugged. In the following week, the clock striking in her parlour alarmed her, and I was sent for. The drops were now used every night for three weeks, and every day fresh proofs of returning function. At the expiration of two months hearing was perfect, and I am happy to say has remained so to the present date.

W. R., Esq., of Scarborough, had suffered for a long time with lumbago, caught by hunting. He had received the advice of many medical men, and had undergone a variety of treatment, which had at times given him temporary relief, but every fresh exposure to exercise on horseback produced the malady. He consulted me in July, 1851. I ordered the loins to be well rubbed with the tinct. guaco night and morning, and a belt of red flannel to be worn, instead of the one of chamois leather. He then had a mixture, viz.:—

℞. Tinct. guaco ʒ iij., aquæ destillatæ ℥ vj. M. capiant cochlearia magna ij. ter die, with occasionally a mild aperient pill, generally pil. rhei co., gr. v.

In three weeks he was perfectly free from the complaint, and can hunt or exercise himself in any way; and, up to the present time, has had no return.—*Med. Times and Gazette, Dec.* 25, 1852, *p.* 651.

143.—*Antidotes to Serpent-Bites.*—[A correspondent in 'The Lancet,' who states his having been in India several years, confirms the testimony as to the value of *ammonia*, or *eau de luce*, in the bites of these snakes. He says:]

I had a servant bitten on the finger by a large cobra de capello, six feet long, and decided symptoms of poison appeared before any medicine was administered. I gave a teaspoonful, or drachm, of eau de luce in a wine-glass of water, applied a tourniquet above the elbow, washed the bitten part, which was much lacerated, and applied lunar caustic, and kept the patient moving (walking), supported by two men. The medi-

cine was repeated every ten minutes or quarter of an hour, according to the urgency of the symptoms, and four or five doses were given, when the symptoms diminished, and the patient gradually recovered, but afterwards complained of soreness in the throat from the effect of the medicine.

A medical officer at Gorruckpore, Dr. Butler, informed me he was equally successful in his treatment, which consisted in full doses of laudanum, hot brandy-and-water, and peppermint.

We are totally ignorant of the nature of the poison of the cobra, but it acts in a very short space of time, and, unless strong stimulants be given, soon destroys the vital power. The blood becomes remarkably fluid, and oozes out from any scratch or puncture.

When at Mhow, in Malwa, in Central India, a groom in our regiment was bitten by a poisonous green snake, common in that part of the country. The poison of this snake, which is described in Russell's book, will kill birds or small animals, but is not sufficiently powerful to destroy the human subject.

The man was bitten near the wrist, and the arm swelled up to an immense size, and he felt uneasiness, but no pain. I washed the part, and applied three or four leeches over the bites, and the blood continued to ooze from them for two or three days, and also from two places on the back of the hand, which had been accidentally scratched before he was bitten.

In that part of the country there is a very beautiful and venomous snake, of a bright yellow colour, with black stripes. It is drawn and described in Russell's book on Snakes, under the name of *Ketula retula poda*. This snake is considered more venomous than the cobra, and has very much larger fangs. I have some in my possession from this snake, which was little more than three feet long, but which are about twice the size of those from a cobra six feet long.

When at this station, Mhow, some snake-charmers were exhibiting these and other snakes, and I observed they had a small pot of live charcoal, in which were two or three small iron instruments, made like a tenaculum, of the exact size and curve of the large poisonous fang. They informed me, they always had these ready heated, in case of accidents; that, if bitten, they were immediately applied to the punctured part, and that no ill consequence ever followed. This plan of applying the *actual cautery*, appeared to me so very reasonable and scientific, that I had an instrument made after the same pattern.

The "snake-stone," supposed to be a remedy by some natives, is a smooth stone, about the size of half-a-crown; it is moistened, and applied over the bitten part. By preventing atmospheric pressure, it no doubt retards or prevents absorption of the poison, and the same, or better effect, would result from the application of cupping glasses, but, generally speaking, they could not be applied to the bitten part, which is usually on the hand or foot.

Suction will remove the poison. I knew the life of a person saved by an acquaintance of mine; he was bitten in the leg by a cobra, the wound was immediately sucked, and no ill consequence ensued.—*Lancet, Dec.* 25, 1853, *p.* 594.

144.—EXCISION OF THE KNEE-JOINT—FATAL TERMINATION OF THE CASE.

Under Prof. FERGUSSON, F.R.S.

[The following is the subsequent history of the case reported at page 134. Matters went on favourably for twelve days after the operation, excepting a little vomiting and shivering, which, however, resisted means used to control them, perhaps from their dependence upon pyæmia.]

The patient became gradually weaker, and died on the sixteenth day after the operation. As this is a case of much importance, which is likely to have a vast deal of influence on the confidence which should be placed in the operation of excision of the knee-joint, we shall deviate a little from our custom, and instead of condensing the description of phenomena, as we are wont to do, we beg permission to enter fully into the details of the case, aided by the notes of Mr. Price, the dresser of the patient.

Day of the excision of the knee-joint.—The patient had thirty minims of laudanum after she had been placed in bed.

First day after the operation. The patient slept about an hour in the night, and vomited several times; she has had a good deal of pain and starting in the limb; tongue moist; pulse at nine o'clock a.m., 126; at nine p.m., 160.

2d day. Slept better last night; the leg is free from pain, but the patient complains of headache; the bowels are confined, the tongue rather foul, and the skin dry; pulse 140; and at nine p.m., 148. Mr. Fergusson ordered effervescing draughts, with acetate of morphia, to be taken every fourth hour.

3rd day. The patient slept only two hours on the previous night, being disturbed by a dying patient lying in the same ward; she still complains of headache; feels no pain in the limb, and takes her beef-tea and brandy well; the eggs make her sick; pulse 129.— Three p.m.: The dressings were changed this day for the first time; the wound looks well; slight suppuration has set in; the limb lies in a good position; it gave her no pain to have it dressed; the bowels not having been open since the operation, half an ounce of castor oil was prescribed.

4th day. The castor oil operated twice, and made her sick in the night; she had but very little sleep, but felt pretty comfortable in the morning, and was free from pain in the leg. The patient is thirsty, the tongue dry and brown, and the pulse at 130. Lemonade was ordered, and she was desired to name anything she fancied.

5th day. The night was better, and the patient is more cheerful; pulse 110. The splint was changed, and there is a plentiful discharge of healthy pus from the wound; the transverse incision has united by first intention; there is no pain in the limb.

6th day. The night was better; the tongue cleaner; the patient is not so thirsty; the limb is quite free from pain, and the discharge plentiful and healthy; pulse 120. In the evening of the same day the girl fainted while the dressings were being changed; she soon recovered, but fainted again twice in the course of an hour.

7th day. Very little sleep last night; pulse 130; the tongue is foul,

but there is no pain in the leg. The patient looks pale and distressed: she refuses her food, and coughs a good deal. There is a slight abrasion over the sacrum from lying in one position, which abrasion annoys her a good deal. She was ordered a cough mixture.

8th day. The girl is more cheerful to-day, and has had a better night. Some amadou plaster and a pad of cotton-wool were applied to the back with great relief; pulse 125; appetite rather improved; beef-tea, brandy, oysters, fowl, &c., &c.

On the 9th, 10th, and 11th days, the principal symptoms were severe cough and diarrhœa, which were combated by appropriate remedies.

On the 12th day the patient was very low and faint, and complained much of her back, which had become more inflamed.

On the 13th, 14th, and 15th days the patient became weaker, though every possible means were used to keep up her strength. Dr. Todd saw her with Mr. Fergusson on the fifteenth day, and advised an enema of beef-tea to be given, which was returned about seven o'clock in the evening.

She continued to vomit very frequently; this symptom was relieved by means of creosote and morphia, but the grumous vomiting returned again about seven o'clock, gradually lowering the strength of the patient. She died on the sixteenth day.

No post-mortem examination was allowed by her friends, but Mr. Fergusson, about forty-eight hours after death, examined the joint, and found it in a flabby condition, such as is usually met with when death occurs at such a date after an operation: the granulations were soft, and there was no indication of action leading to the formation of bone, nor any attempt of the edges of the wound to granulate. The surfaces of the ends of the bones were looking very unhealthy, the periosteum separating readily from them, as was observed during the operation. No swelling about the region of the thigh or groin, or any enlargement of the other joints were observed; nor could any sign of effusion into the chest be detected. The body was much emaciated.

It is a pity that the inspection was restricted to the joint, but it may perhaps be inferred from the symptoms that pyæmia was the cause of death. Whatever the cause of the fatal issue may be, it is plain that the result is not such as to encourage attempts in the same direction—the more so as patients who have long suffered from disease of the knee-joint are so debilitated by suffering that they do not seem to be favourable subjects for an operation which appears to make greater call upon the system than amputation.—*Lancet, May* 7, 1853, *p.* 425.

145.—ON THE USE OF A VERTEBRAL HOOK IN SOME CASES OF DIFFICULT DELIVERY.

By Dr. Henry Oldham, Obstetric Physician to Guy's Hospital.

[This instrument is intended to pass some distance into the vertebral canal, and secure a ready and firm hold upon the arches of the vertebræ. In this way it forms a powerful tractor and effective instrument for delivery.]

This vertebral hook is of simple construction; its length is fourteen inches, of which four inches are taken up in the handle, which is roughened on the surface, and sufficiently large to afford a good grasp. A straight steel stem well fixed into the handle, and gradually tapering to the extremity, is bent at an acute angle, the free point being fined off at the edge to facilitate its being fixed. The bent part forming the hook is half an inch long, and projects at such an angle that it easily traverses the upper part of the vertebral canal in a mature or even a seven months' fœtus, and, if well made, it is quite strong enough to bear, without yielding, any degree of traction by the hand. When using it, all that is necessary is to seek for the foramen magnum, and to push the hook within it. The cord breaks down before it, and when within the canal it only requires a slight rotatory movement to be made to find it fixed firmly on the arches. The best way to demonstrate the use of this instrument is to run it into the vertebral canal of a fœtus already delivered by craniotomy, when the ease with which it becomes fixed, and the difficulty of removing it when once it is fixed, will at once be seen. The upper part of the vertebral column forms an excellent point for traction, as the force is well kept on that part of the skull, which, next to the presenting parietal bone, it is best to keep the lowest. The hold too is so firm, that there is not the same necessity as with the crotchet for counter-support with the other hand and finger, and consequently there is less need of vaginal manipulation.

The vertebral hook does not supersede the crotchet or craniotomy forceps, as in a majority of cases these instruments, and especially the former, accomplish delivery as safely and expeditiously as circumstances permit. But in some cases of unusual difficulty it comes greatly to our assistance. I have found this to be the case where there has been considerable pelvic deformity, associated, it may be, with rigidity of the soft parts in a first labour; and, if labour has gone on for long, with inflammatory congestion and great tenderness of the vagina, or œdema of the labia and perineum. The prolonged efforts with the crotchet which some of these cases require, gradually break away the bones to which it has been applied, and still the head, if the deformity is in the conjugate diameter, may remain above the brim. Further attempts with the crotchet involve a good deal of handling, and occasion considerable pain, although its full power and efficiency is not tried until it has been applied outside the head, or on the edge of the orbit, where a good purchase may be obtained. In these exhausting cases, both to the patient and practitioner, a vertebral hook is a valuable resource.

This hook is of essential service, too, in cases where the trunk of the fœtus has been removed and the head left behind, whether it be designedly, after severing the one from the other, in an arm presentation, or when, in attempting to extract a fœtus by the feet, in a deformed pelvis, the neck has given way in the efforts to bring the head through the brim. I have had to deliver the separated head under both these circumstances.

In April, 1851, I was requested by Mr. Remington, of Brixton, to see a patient with a deformed pelvis, who had twice been delivered by the crotchet, and on one occasion premature labour had been induced,

and a live child born. She had again advanced to seven months and a half, when Mr. Remington ruptured the membranes, and five days afterwards labour set in, and an arm protruded. Mr. Remington and two of his medical neighbours had tried to turn, but failed. A full dose of opium had been given. When I saw her the left arm was beyond the vagina, livid, the skin peeling off, and the uterus contracting energetically. To turn seemed impossible. On making traction with the protruding arm, with the view of getting the thorax within reach of the perforator, it gave way. Having a decollator with me, I passed it over the neck and divided it, and at once removed the trunk. I then, without difficulty, run the vertebral hook within the spinal canal, and with the hold so obtained, drew the head through the narrow brim. In the same way I was enabled to deliver in a case where, after long-continued traction, the head of a mature fœtus remained fixed in a contracted brim, the breech having presented and the body of the fœtus withdrawn. When I saw this case the vertebræ had given way, and the neck was held only by soft parts. Whilst endeavouring to fix the head so as to perforate the occiput, the neck separated, leaving the head behind. The uterus was supported in a contracted state upon the head. By pressure over the lower part of the abdomen, and with a little management, I ran the vertebral hook within the canal, and so fixed the head that I was enabled to pass a perforator into the occiput, and then delivered with the hook. The great difficulty of removing a separated head is a practical objection to the use of the decollator in arm presentations, when turning is impracticable; but, so far as my experience goes, I think a vertebral hook will so far assist in the delivery of the head as to allow this operation an occasional preference over the perforation of the thorax, and the delivery by the breech.

This month (May 5, 1853,) Mr. Shaw requested me to see a patient of his, whom he was attending in her second labour, the breech having presented. The trunk of the child and the arms were born, and he endeavoured unavailingly to remove the head. I found that the efforts which he had made had separated the cervical vertebræ, and the integuments alone maintained a loose connexion between the head and trunk. The brim of the pelvis was much contracted, measuring about two inches and a quarter in the conjugate diameter, and the bony edge of the brim and pubic arch was very sharp. I endeavoured to fix the head sufficiently firm at the brim, by traction upon the neck, to allow the perforator to pierce the occiput; but, before this could be done, the integuments gave way, leaving the head loose and moveable about the brim. I then felt for the opening into the vertebral canal, and endeavoured to push the vertebral hook through it. For a few minutes I was foiled in accomplishing this, on account of the broken state of the vertebræ, which had been torn through, but having passed by the fragments and entered the canal, it ran up at once and caught a firm hold, with which I was enabled so to fix the head as to perforate the occiput and break up the brain, an operation, with so contracted a pelvis, of considerable difficulty. I then drew down with the vertebral hook, and was making good way, when the vertebræ yielded, and I found that the hook, which had been fixed upon the atlas, had separated this bone from

the base of the skull. With the crotchet I was now able to enter the skull through the perforated opening, and to obtain a firm purchase, but the bone soon broke under the forcible traction, and having torn away a great part of the base of the skull, and the petrous portion of one of the temporal bones, I was at last enabled, after an hour and a quarter's severe work, to draw the head through the narrow brim, the crotchet being fixed over the orbit inside the skull.

In this case the vertebral hook was of the greatest value, and Mr. Shaw and I were satisfied with the easy application of it, and the firm purchase it afforded. The vertebral bones gave way under the powerful efforts I was obliged to make with it; but having by its means opened the head, I was able to use the crotchet advantageously. The extreme difficulty of removing a head slipping round in the uterus, which rather closes over than contracts upon it, and above so narrow a brim, cannot well be overstated. To perforate under such circumstances, with the hand and the instrument buried so deeply, and the head receding on being touched, which no external pressure can prevent, is most difficult; and Mr. Shaw and I felt that the vertebral hook came most opportunely to our assistance, and enabled us to get through a very forbidding case satisfactorily.—*Lancet, May* 14, 1853, *p.* 447.

146.—*Fomentations of Digitalis in certain Kinds of Ascites.*—Dr. Raymond Falot has published in the 'Revue Thérapeutique du Midi' three cases of inflammatory ascites in which diuretics were not well borne by the stomach, and where fomentations with a decoction of digitalis-leaves produced marked action of the kidneys, and absorption of the fluid effused in the peritoneum.

The first case is that of a girl twenty-four years of age, who, after severe wetting, was attacked with subacute peritonitis and consequent ascites. Nitre and powdered digitalis had very little effect, and tapping to twelve quarts took place. As the liquid re-accumulated, fomentations were made with a decoction of two ounces of digitalis to a quart of water boiled down to a pint. The liquid was applied by means of compresses soaked in it, and covered with oiled skin to prevent evaporation. The kidneys acted very powerfully, and the effused fluid became completely absorbed. The same means also succeeded two years afterwards when the patient suffered again from ascites.

The second case refers to a boy eight years of age, who had ascites after intermittent fever. Both the syrup and powder of digitalis were ill borne: the fomentations were used as above described, and the effusion disappeared, whilst the kidneys and skin were acting powerfully.

Third case.—A man fifty years of age suffered from ascites after a very severe attack of gastric fever. No sort of medicine could be borne; the digitalis fomentations were resorted to, and the same favourable results as in the previous cases were obtained in a few months. Dr. Falot states that he does not wish to give his mode of treatment more importance than it deserves, but that he was much struck with the coincidence between the use of the fomentations and the increase of the

renal and the cutaneous secretions. In one of the cases frictions with the tincture of digitalis had been used without success. The fomentations will certainly be worth a trial when the usual diuretics cannot be given by the mouth. The leaves should not be more than one year old. —*Lancet, May* 7, 1853, *p.* 428.

147.—LARGE HÆMATOCELE OF THE THYROID GLAND, CAUSING URGENT DYSPNŒA BY PRESSURE UPON THE WINDPIPE—TREATMENT BY FREE INCISION—CURE.

By E. R. Bickersteth, Esq., Liverpool.

[Mr. Bickersteth was consulted on the 27th September last, by Mrs. M., regarding a tumour resembling a large bronchocele, extending from the top of the sternum to the top of the larynx. It was smooth and fluctuating, and the integuments very thin over the most prominent portion. It had existed three years; but latterly the breathing had become much oppressed. The fluid, of a thin dark appearance, was drawn off by a trocar and canula, to the great relief of the patient. On the 4th of October, however, she returned, with the symptoms more aggravated, and the tumour larger; the fluctuation being quite as distinct as before. Mr. Bickersteth proceeds:]

From the consideration of the circumstance that the tumour was composed of a single cyst, and that its contents were entirely fluid, as apparently proved by the former tapping, admitting, consequently, of complete evacuation, I thought that injection with tincture of iodine, after the sac had been completely emptied, would afford a reasonable prospect of inducing its obliteration; and I was further encouraged to attempt this treatment by the recollection that, even if it should fail, no obstacle would be presented to the more severe measure of laying the cavity freely open.

Three drachms of the pure tincture of iodine were placed in a glass syringe, and I prepared to inject, having first emptied the cyst as far as possible. About four ounces of dark fluid blood, much thicker and more tarry than upon the last occasion, passed freely through the canula, and the swelling was removed as effectually as before. But now florid blood began to ooze very rapidly, and continued to do so in spite of the means used to check it. On this account the injection was discarded, for I feared the free hemorrhage would prevent the tincture from coming into contact with the walls of the cyst, and thus fail in producing the requisite degree of inflammation; moreover, I did not like the consequences of mixing tincture of iodine with fresh blood in the interior of a cyst occupying this situation. The canula was therefore withdrawn, and perhaps it was as well, for within five minutes the tumour was almost as large as ever. Still the relief to her immediate distress was considerable, and at her request a short delay was granted, before proceeding to more radical treatment.

October 8th.—She is now earnestly desirous that something should be done immediately to relieve her. The breathing is more laborious than ever. The inspiration prolonged, and performed with considerable effort.

Each attempt is accompanied by a peculiar crowing sound. The tumour is very firm and tense; and the skin is ecchymosed over the whole of the neck and chest. The patient being seated upon a chair, with the head thrown back and supported by an assistant, I introduced a sharp-pointed bistoury into the most prominent part of the tumour, a little to the right of the mesial line, and having opened the cyst, I enlarged the wound downwards to the extent of about two inches, by means of a curved probe-pointed bistoury. I now ascertained that the cyst was of much greater size than I had previously imagined. It passed downwards and backwards deeply into the root of the neck, behind the sternum and in front of the trachea, further than my finger would reach; and from this part I was able to turn out large clots of dark solid blood. Hitherto there had been very little hemorrhage; but, in order to treat the case effectually, it appeared necessary to make the external opening still larger, for as yet not more than one-third of the known extent of the cavity had been opened. But at the lower part its depth from the surface greatly increased, and a considerable portion of the substance of the thyroid was evidently placed before it, so that by cutting in this direction, the danger of wounding important vessels was great in proportion. Using my knife in the same manner, I again extended the incision to within half an inch of the top of the sternum, and thus laid open the cyst as freely as it was possible. Even then I could not find the bottom of the cavity. The hemorrhage from this last incision was very profuse; the blood spouted in every direction as from a sponge, and proceeded manifestly from the divided walls of the thyroid. After the loss of a few seconds spent in a vain endeavour to secure the vessels by ligature, the cavity was stuffed with lint till the cut surfaces were widely distended, and then, by drawing a few straps of adhesive plaster from side to side, a uniform and steady pressure was secured, which immediately and effectually checked all further bleeding.

The future progress of the case has in all respects been most satisfactory. Not a single unfavourable symptom occurred. On the third day discharge from the wound commenced, and part of the lint came away; and at each succeeding dressing a portion separated, until on the eighth day the whole had been discharged. Then the cavity began to contract, and the swelling and discharge to decrease. At the same time the margins of the wound approximated, and showed so great a tendency to unite, that it was necessary every second or third day to introduce my finger, in order to keep the opening patent until the obliteration of the cyst was complete, &c. To hasten the process, I directed a blister to be applied, and with most beneficial results. The discharge became thin, and of small amount. The edges of the incision puckered in, and have now (five weeks after the operation) all but closed, forming a deep furrow, with the divided lobes of the thyroid on either side. The breathing has continued perfectly free, and the voice also is slowly recovering its natural tone and force.

The perfect relief afforded by this treatment to the most urgent and distressing symptoms was most gratifying, and the simplicity of the operation, together with the absence of any unfavourable occurrence, is highly encouraging for future guidance.

The real, as compared with the apparent, size of the cyst,—its extension downwards so much further than was indicated by external examination,—its partially solid contents, when fluid alone was discovered with the trocar, and every reason existed for supposing that none other was present,—are facts not to be forgotten, and must always more or less influence our diagnosis, until an actual exploration with the finger has been effected. It may be remembered also with advantage how utterly useless in the wounded thyroid the ordinary method of securing the vessels by ligature proved, and how easily profuse arterial hemorrhage was stopped by continued pressure.—*Monthly Journal of Med. Science, Dec.* 1852, *p.* 540.

148.—IMPROVED METHOD OF CONTINUOUS IRRIGATION.

By John Hilton, Esq., F.R.S.

[Hitherto, in Guy's Hospital, irrigation has been performed by dipping one end of worsted threads in some convenient receptacle of water, and applying the other to the part to be irrigated. This, however, is somewhat uncertain, and Mr. Bigg, of St. Thomas's street, under the direction of Mr. Hilton, has supplied the deficiency by constructing the following apparatus:]

The instrument consists of a zinc reservoir, with a vulcanized india-rubber tube opening from it at its side, close to the bottom. The entrance of water into the tube is regulated by a stop-cock; at the other end of the tube is affixed a broad zinc head, resembling a compressed or flattened rose of a watering-pot, a linear series of perforations being cut through its lower or convex edge. Equidistant from each other, and about half-an-inch apart, threads of worsted were passed through these holes from within, and made to project about three-quarters of an inch below the metal. This end was suspended over the part to be irrigated; the reservoir charged with water placed upon the usual little shelf situated at the head of the bed, and the stop-cock being turned, allowed the water to escape into the tube. The extent and rapidity of the irrigation were, by the aid of the stop-cock, perfectly regulated. A small sheet of oil-skin was placed under the arm and separated from the bed, the oil-skin being so arranged as to conduct the water which had passed over the limb into a bason or upon the floor of the ward. It is obvious that water of any temperature, or medicated in a prescribed manner, may be made, by this simple and cheap apparatus, to distribute itself over any part, however small or extensive it may be. The advantages of this instrument are, that the supply of water can be regulated by a stop-cock, so that there may be a definite and equable amount of irrigation to every part of the injured structure, or to any particular region, which irrigation can be regulated according to the sensation of the patient, or the temperature of the textures under treatment. By enlarging or diminishing, by elongating or shortening, the head, or varying its form, the drops might also be carried simultaneously over a larger or smaller, or any irregularly-formed surface.—*Lancet, Jan.* 29, 1853, *p.* 110.

149.—ON THE MODE OF FORMATION OF SECONDARY ABSCESSES, AND SOME OTHER CONSEQUENCES OF A VITIATED CONDITION OF THE BLOOD.

By Henry Lee, Esq.

[Mr. Lee, in a clinical lecture at King's College Hospital, lays great stress upon thoroughly understanding the pathology of these affections. This is proved from the unfortunate treatment which was for a long time followed. He says:]

The treatment of these complaints has apparently, until very recently, been dictated by the name which was at first accidentally applied to them. The affections were said to be inflammatory; antiphlogistic remedies were of course to be employed. The symptoms usually did not yield. This was doubtless on account of the violence of the inflammation. More active measures were had recourse to. The lancet was freely employed in England; the application of large numbers of leeches in France. To these were added the free use of calomel and opium, and other remedies calculated, in the language of the writers of the day, to combat and to "beat back" the inflammation; and in this object those who adopted the practice doubtless often succeeded, at least as far as diminishing any external appearance of irritation was concerned. The accounts which they have left us usually terminate with a description of the benefit derived from the means used, and the disappearance of some of the symptoms of local irritation, but that, unfortunately, at last the powers of the constitution were found to give way! The victory over the disease was obtained only at the expense of the power of life; the inflammation was arrested, but, unfortunately, the patient died.

[He then proceeds to enquire as to the mode in which abscesses and deposits consequent upon a disease or injury, form in distant parts of the body.]

Until within a very recent period, it has been taken for granted that the lining membranes of the blood-vessels were analogous in their morbid actions to closed serous cavities. This doctrine was received without question, and it was supposed that the lining membrane of a vein would inflame, and would secrete lymph and pus as readily as the pleura and peritoneum. Upon this was based the further theory, that when secondary deposits occurred as a consequence of local phlebitis, the lining membrane of the vein first affected had secreted some purulent matter, which had been carried in the course of the circulation, and that the particles of pus, being larger than those of the blood, had been mechanically arrested in those situations where the secondary effects manifested themselves.

Now, this is a very clever and ingenious theory, and has received the sanction of some of the greatest names in Europe. But I would ask you to investigate with me the actual facts which can be demonstrated or disproved upon which this theory has been established; and, first, with regard to the power of the lining membrane of the veins first implicated to secrete lymph and pus, is the action of this membrane, indeed, analogous to that of serous membranes generally?

Now, it is true that the lining membrane of veins is very similar in its lubricated and shining appearance to the free surface of the serous cavities. It is also true, that in the interior of the veins a white adhesive matter is often found in its characters resembling the lymph which is secreted from inflamed vessels, and it is also equally true that a white fluid, resembling pus in its general characters, is often found in their interior. But are these the products of inflammation of the lining membrane? Does the lining membrane of veins become injected with blood vessels in a similar way to that of serous cavities, and do its vessels pour out in a similar way lymph and pus?

Now, to these questions all the *post-mortem* dissections which have been hitherto accurately made, answer, I believe, in the negative. The similarity between the lining membrane of veins and the serous lining of closed internal cavities here fails; the former are not capable, like the latter, of being similarly injected in a state of inflammation, nor are they capable in the same way of secreting lymph and pus. The lining membrane of the veins already in contract with the blood does not require blood-vessels for its nutrition, and consequently is not supplied with them; and in its processes of repair and so-called inflammation, having the materials for carrying out the requisite processes always at hand, there is no necessity for these to be supplied by secretion from other vessels.

The subject is one of too great magnitude for me to enter upon fully at present; but at the same time it is absolutely necessary that the ground should be cleared before we can form an unprejudiced judgment regarding the morbid processes which take place in veins. I will, therefore, offer one illustration only, which will, however, I think, be sufficient to establish the points which I have touched upon. I have here the drawing of a preparation now in the museum of King's College. In this case some cotton wadding was introduced into the cavity of a vein, and a similar piece into the peritoneal cavity of an animal forty-four hours before death. The means were thus afforded of testing, by direct experiment, whether these parts were really analogous in their morbid actions. The result was such as I confess I had anticipated. The cotton wadding which was introduced into the peritoneal cavity was surrounded by firmly-adherent lymph, whereas the cavity of the vein, from which the blood had been carefully excluded, contained no lymph at all. Its lining membrane presented rather a redder appearance than usual, owing, probably, to the increase in the size and number of the vessels in its cellular coat. Its valves, two sets of which were in contact with the cotton wadding, had not lost their natural transparency, nor was their any change in their colour. We have, then, here a decisive proof that the blood-vessels are not analogous in their morbid actions to the serous membranes of the body, and especially that they do not, like them, readily supply those secretions which are the common products of inflammation.

You will, then, doubtless, be ready to ask me whence are those materials derived which have the appearances of lymph and of pus, and which are so frequently found in the interior of the blood-vessels. They are deposits undergoing various kinds of changes from the blood itself,

and will never be found, until these changes are far advanced, to have any intimate connexion with the sides of the vessel in which they are contained. This is a point of some importance in the consideration of these cases; for lymph secreted as the result of inflammation always adheres firmly to every part of the surface with which it is in contact. This is, as I have said, not the case with the fibrine when first deposited in the interior of the blood-vessels.

The fibrine once separated from the circulating masses of the blood, may undergo various changes. One of these is its liquefaction. The mass may become softened down. The softening proceeds from the centre towards the circumference. This is illustrated in this preparation, where the central portions have been softened down, and have escaped, leaving the external and firmer parts in contact with the lining membrane of the vein. Large quantities of white purulent-looking fluid may in this way be formed in the veins; and it will afford a very nice subject for any gentleman who will undertake the investigation, to ascertain the qualities of this fluid, its actions, and its microscopical appearances as compared with pus.

Having, I trust, shown that pus is not so readily secreted in the veins as has been generally imagined, I should have little difficulty in giving other reasons to prove that, even where it is so secreted, there would be little ground for maintaining the theory of the formation of secondary deposits upon the supposition that the pus-globules were mechanically retained in the structure of the organs through which they passed.

Time, however, will not permit me to enter more fully upon this part of my subject, which I the less regret since pus will not, under ordinary circumstances, circulate with healthy blood.

Corresponding to the three principal physical changes in the blood which I have mentioned to you as readily appreciated by the sight and touch, are a number of secondary changes consequent upon them, and occurring in distant parts of the system. But these cannot always be recognised as distinct diseases in the living body, or even in *post-mortem* examinations upon the dead; and I must beg of you to remember, that, although I shall attempt to describe them separately, yet that cases will often occur in practice which partake of the characters of two or more of the forms of disease which I propose to notice. Instances will, however occasionally present themselves which will afford well-marked specimens of each variety.

The first form to which I will allude, is that which is characterised by the tendency of the blood to coagulate, in consequence of the admixture of some morbid matters.

Now, whenever this tendency is manifested, the blood passes with difficulty through the vessels, and although it may not be arrested at once in its circulation, yet it is rendered often darker and more viscid than natural. Should the coagulation take place at once, the portion of blood affected, together with any extraneous matter it may contain, is fixed and localized in a particular spot. But should this effect not immediately take place, the vitiated blood may continue its circulation. Its passage through the vessels will then be less free, its fluidity will be impaired, and there will be a constant tendency for it to stagnate, pro-

ducing the appearance of congestion at different parts. This tendency will naturally manifest itself in a greater degree in some parts than in others. The action could scarcely take place where the current of the blood is naturally rapid, or where it is impelled through the vessels with much force, as in the arteries. We should, therefore, naturally expect not to find this effect frequently produced in any of the large vessels of the body. The aggregate diameter of the branches derived from the trunk of any blood-vessels is, as you know, much larger than the trunk itself; and it necessarily follows, that in the circulation of the blood the rapidity of the movement in the larger vessels compensates for the slower movement in the large collective area of the smaller branches. For this reason, we seldom find that the blood coagulates in the larger veins, in the heart, or in the arteries during life, although instances may be given of this action in all these situations.

We should naturally look for this effect where the propelling and the retarding forces were nicely balanced, in those situations where the blood was divided in the smallest quantities, and where its motion was most tardy. Now, these are precisely the circumstances under which we generally witness this effect. In the delicate internal structure of organs where the blood is minutely divided, and where its circulation is comparatively slow, a few scattered vessels may sometimes be observed congested and distended; at other times, these may be more in number; but the most frequent appearance is that of a more or less oval mass of dark livid congestion. In the majority of instances, the system of minute blood-vessels to which the vitiated blood would first be carried in the natural course of the circulation, is that in which such appearances are found. The blood, as you well know, passes from every part of the body, continually increasing in the rapidity of its motion till it reaches the heart. During its transit, the force of the circulation prevents any stagnation except in the severest cases. From the heart the blood is conveyed to the lungs; and as its stream is divided and subdivided, its motion becomes slower and slower; and in the most minute branches of the pulmonary vessels it is that the effects I am describing most frequently manifest themselves. Blood vitiated in the way in which I have supposed, does not, however, necessarily stagnate at the first system of minute tubes into which it is conveyed. It may pass several times, in the course of the circulation, before it is arrested in its progress. Thus, in cases of injury of the head, the secondary effects of suppuration in the diploë of the bone may fall upon the liver, in which case the contaminated blood would, of course, have previously passed through the lungs; and, on the other hand, I have known secondary abscesses in the lungs follow the ordinary operation for hemorrhoidal tumours, where the vitiated fluid must have first passed through the liver. Such instances, I need scarcely remind you, are with much difficulty reconciled with the mechanical theory, so long and so ingeniously maintained, that these secondary deposits have their origin in the lodgment of pus globules in capillary tubes which are not sufficiently large to allow their transit.

Now, the disease under consideration is essentially the same, in whatever part of the vascular system its effects may be manifested,—whether

the blood has stagnated in one of the larger vessels of the body, or in the interior of some organ, the subsequent changes are strictly analogous; and the subsequent actions are the same, (although they may differ in intensity and in the time of their development,) whether the morbid matter is directly introduced into one of the larger veins, or whether it is conveyed, by means of the circulation, to some distant part. There is, however, this important point to be considered, viz., that vitiated fluids directly introduced and retained in a vein are likely to be in a much more concentrated form than after they have been mixed with fresh portions of blood in the course of the circulation. Still, the morbid processes by which an abscess is formed in the course of a vein, in the primary and in the secondary form of the disease, are similar. The coagulum, containing some vitiated fluid, which is lodged in the vessels, becomes a source of irritation, and we may judge of the action that takes place in the smaller veins of the body by that which we can trace in the larger.

When any foreign matter, either in a solid or a fluid form, is detained in a vein, the cellular tissue around becomes infiltrated with serum. If the vein is near the surface of the body, the skin becomes swollen, red, and tender. Should the irritation continue, the cellular coat of the vein will become greatly thickened, so that, when it is cut across, the divided extremity will remain open like that of an artery. The lining membrane of the vein will become red, being stained by the imbibition of the colouring matter of the blood. Should the irritation continue, the cellular tissue on the outside of the vein will suppurate, and a series of little abscesses will form around the affected vessel. It is important to remark, that the pus is here first produced outside the vessel. But during this time other changes will be going on within. The coagulum of blood may become more or less adherent to the sides of the vein. Its central portions may become deprived of their colouring matter; and, if the disease continues, they will become softened down. The whole of the surrounding parts will then become blended together by effusion of lymph, and, upon a section, they will often present a uniform lardaceous surface where the different structures can no longer be distinguished.

In the interior of the lungs, where this process can be best observed in its secondary forms, a deep purple congestion of one or more of the lobes of the lungs will first take place. The congested patch will become hard from the effusion of lymph. The hardening will extend from the centre towards the circumference. In the interior of the indurated and congested portions, some small collections of white fluid will then present themselves. These are doubtless derived, as in the case of the larger veins, from two sources—from the suppuration in the cellular tissue around the vessels, and from the softened coagula within them. As soon as the fluid begins to appear, the affected portion is softened, and easily broken down. The softening gradually proceeds in the same order as the induration, from the centre to the circumference of each affected part, until each patch is converted into a collection of purulent looking fluid.

This process, or one analogous to it, may, as I have said, take place in any part of the vascular system. The morbid matter may produce it

at the point where it is first introduced into a vein, or it may travel some inches along its canal, and there be arrested; or, finally, it may pass through the central organs of the circulation, and its effects may then be manifested in any part of the system.

Now, it will often happen that a coagulum, when first formed, may be sufficiently firm to retain any morbid matter which may happen to be in its interior; but after a time, this may become softened down, and the fluid resulting from that liquefaction may escape into adjacent veins. The same thing may happen in certain states of the constitution with a regard to a coagulum of simple unmixed blood. The coagulum may become softened down, and subsequently mixed with fresh portions of blood. One of two things may then happen; either the dissolved clot may terminate the coagulation of the fresh portions of blood with which it comes in contact, or else it may be carried forward in the general course of the circulation, producing its secondary effects at a distance. If the newly-formed coagulum is sufficiently firm to retain the dissolved matter, an irritation will be set up around the vein, such as I have attempted to describe as resulting from the direct introduction of morbid matter. This irritation will probably terminate in suppuration around the vein; the contents of the vein will then become softened down more or less perfectly, and will be discharged with the pus of the surrounding abscess.

Three or four cases of this kind have presented themselves in the hospital during the last few months,—cases where abscesses had formed in the course of a varicose vein, in the process of its obliteration. In these instances no constitutional symptoms usually are produced beyond the slight degree of fever which accompanies the formation of a common abscess. But there is one very interesting case in the London Ward, where some unusually severe symptoms presented themselves. He is a man of a very phlegmatic disposition, on whom I operated for the obliteration of varicose veins. The coagulum in the upper part of the saphena vein in this case remained quite firm; but the lower coagulum near the knee softened down, and gave rise to a good deal of constitutional disturbance. Owing, however, to the complete obliteration of the trunk of the vein in this case, none of the fluid derived from the dissolved clot could pass directly into the circulation in its usual course. There was, therefore, no extension of inflammation in the course of the vessel; but considerable redness and swelling extended to the back and inside of the thigh, and one or two fresh abscesses formed in these situations. These symptoms indicated, I have no doubt, that some of the dissolved matter, which could not find its way along the obliterated trunk of the vein, gained admission to some collateral vessels; but, being detained in the smaller anastomosing branches, probably by a fresh coagulation of their contents, it there gave rise to the symptoms observed.

If the principles of the pathology of this disease, as I have endeavoured to illustrate them, be correct, you will, as I have already said, have little difficulty in forming a judgment of what should be in general the mode of treatment. The security of the patient in the early stages of the disease, before any internal organ is affected, depends upon the firmness of the coagulum formed in the veins originally implicated.

Bleeding, calomel, and antimony have a tendency to diminish the coagulating power of the blood, and are, therefore, I apprehend, not suitable remedies for this disease. If such means be employed, they will loosen the adhesions, and dissolve the connexions formed between the coagulated blood and the sides of the vein. In this way the local appearances of irritation may be subdued. The redness, the swelling, and the pain of the part may be in some cases entirely relieved; but this is only because the vitiated contents of the vein are dissolved and carried to some other part of the system; and while the surgeon is congratulating himself upon the disappearance of the local malady, he may be surprised to find other symptoms of a still more formidable kind developing themselves in some distant part.

The plan of treatment which I have now for some time followed in these cases is to give the patient all those articles of diet or of medicine which are calculated to support his general strength, and especially such as are calculated to maintain unimpaired the coagulating power of the blood.

I do not say but that, in some of the congestions arising from and connected with this disease, local bleeding may not be of advantage, especially as it may tend to unload the distended vessels of their morbid contents. But this treatment is not at all incompatible with the use of every means calculated to support the patient's general powers. In several cases I have now from the earliest stages of the disease given tonics freely, and especially I have used as medicine the different preparations of bark. Both in the primary and secondary forms of this disease, wine or other stimulants may often be given with much advantage. The patient to whose case I last alluded, took at one time as much as twelve ounces of brandy a-day, with the most signal and marked benefit. The effects of such means upon the system must be of course carefully watched; but, under due regulation, I have no hesitation in affirming, that in any given number of cases, the tonic mode of treatment, pursued from the commencement, would prove far more efficacious than any of a different character.

I have now gone over one only of the divisions of my subject. There yet remain for consideration two scarcely less important classes of diseases, namely, the secondary effects produced by an abnormal disposition in the blood to separate into its different elements, and the secondary effects of the decomposition of portions of blood induced by the direct admixture of vitiated fluids, in consequence of accidents or operations. These I shall hope to have an opportunity of bringing under your notice upon a future occasion.—*Med. Times and Gazette, Jan.* 29, 1853, *p.* 105.

150.—ON ORGANIC CHEMISTRY.

By Dr. A. W. Hofmann, F.R.S., Professor at the Royal College of Chemistry.

[Organic chemistry is supposed to be in contradistinction to inorganic chemistry; treating alone of those substances entering into the constitution of vegetables and animals. But in reality, plants and animals have no special elementary constituents of their own, all their elements being found in compounds of undoubted mineral origin, yet]

Among the twelve or fourteen elements, there are four which predominate in the composition of vegetable and animal matter; that is, if the vegetable and animal kingdoms be taken as a whole, and those individual plants and animals which exhibit a preponderance of some other element be regarded as exceptional cases. These four elements, let me repeat it, are carbon, hydrogen, nitrogen, and oxygen. They differ from the rest, not only by the prevailing quantity in which they are present, but also by the distinguishing peculiarities exhibited in several other points. If animal or vegetable matter be exposed to a high temperature, free access of atmospheric air being admitted, we find that a part of it is dissipated, while another portion cannot be volatilized, and is no longer affected by the process of heating. Now, analysis shows that in this case it is exactly the carbon, hydrogen, nitrogen, and, to a considerable extent, also the oxygen, which are carried off, while all the rest, whatever their nature may be, remain behind. Take as an illustration the bone of an animal. It contains carbon, hydrogen, nitrogen, oxygen, phosphorus, and calcium. The three former, together with a portion of the oxygen, are present in bones in the form of gelatin or glue; the rest of the oxygen, together with the phosphorus and calcium, in the form of phosphate of lime. Now, if this bone be heated in the air, the whole of the gelatin is gradually burnt off, nothing but phosphate of lime remaining behind. I hold in my hands two pieces of bone of about the same size—the one fresh, still contains the gelatin; the second has been subjected to the action of heat. They are very similar in shape and external appearance; a difference, however, will become at once perceptible if you compare their weights.—the burnt being much lighter than the unburnt bone.

A similar behaviour is exhibited by all vegetable and animal substances. When submitted to combustion, their carbon is converted into carbonic acid, their hydrogen into water, whereby the greater part of their oxygen is volatilized; the nitrogen escapes as such, the rest of the elements remain behind, in the form of what is generally called the ash of animal or vegetable matter. And this effect is by no means exclusively produced by combustion. All vegetable and animal matter, when no longer under the influence of vitality, undergoes gradually a similar change, becoming subject to those grand processes of destruction, daily accomplished under our eyes, which are designated by the terms "decay" and "putrefaction." The ultimate result of these processes is similar to that of combustion.

We might accordingly distinguish the elements which enter into the composition of plants and animals as *volatilizable* and *fixed*, or, if you please, as *atmospheric* elements and *earthy* elements; for when separated in these processes of destruction, the former mingle with the atmosphere, while the latter mix with the mineral matter of the soil. The distinction in vegetables and animals of atmospheric and earthy elements appears even more appropriate if we glance for a moment at the mode in which plants and animals are formed. The researches of agricultural chemistry have shown, that, while the growing plant finds ample stores of all its fixed elements in the mineral constituents of the soil, it is the atmosphere from which it derives its carbon, its hydrogen, nitrogen, and

oxygen,—the very elements which, as we have seen, the dying plant returned to the atmosphere. The animal, feeding as it does on plants, likewise receives, although less directly, its carbon, hydrogen, &c., from the atmosphere. The distinction of atmospheric and earthy elements, therefore, appears perfectly justified, whether we consider the origin of plants and animals, or whether we regard the ultimate results of their destruction.

Both the atmospheric and the earthy elements combine with each other to form a very great variety of compounds, which are called the "proximate constituents of plants and animals." Starch, sugar, the various vegetable and animal fats, the great number of acids occurring in plants and animals, such as tartaric, citric, malic, benzoic, hippuric, and uric acids; the host of alkaloids of a similar origin, such as quinine, strychnine, morphine, caffeine, urea, &c.; the various colouring matters, the essential oils and resins, &c., are among the endless variety of proximate constituents that are formed by the atmospheric elements. On the other hand, the earthy elements are associated to compounds less varied perhaps, but still presenting a considerable diversity of composition,—the sulphates of potassa, soda, and lime; the silicates and phosphates of these bases, the corresponding chlorides, &c., are the most frequently-occurring forms in which the mineral elements either exist in vegetable or animal structures, or are left in their ash after incineration.—*Med. Times and Gazette, Feb.* 5, 1853, *p.* 131.

151.—ON THE ARREST OF CONTINUED FEVER BY CINCHONISM.

By J. Ogden Fletcher, Esq., Surgeon to the Manchester Union Fever Wards.

[Mr. Fletcher remarks, that, in 1847–48, during the Manchester epidemic, he came to the conclusion that in all cases of fever, with tendency to bowel complication, the early administration of quinine would check, if not cut short, the disease. The result of his observations in eighty cases of fever, is as follows:]

1st. In the majority of the cases, cinchonism established a permanent convalescence within forty-eight hours.

2ndly. In the cases where the typhoid character was established prior to the use of the remedy, five-sixths were convalescent within fourteen days.

3rdly. In children and patients under puberty, suffering from uncomplicated typhus, nine-tenths were discharged cured within 14 days.

4thly. In cases complicated with pneumonia, and attended with rose-coloured spots, the latter disappeared under cinchonism; but a more active form of fever often supervened, which required depletion and other active remedies.

5thly. In all cases where the complication was well established—whether pneumonia, ulceration of the bowels, or cerebral congestion—cinchonism produced very little good.

In illustration of the special effects of the drug on the disease, I subjoin the following cases from the register:—

Case 1. Mary Burns, aged twelve, plethoric habit, was admitted on Feb. 12th, 1853, complaining of severe pain in the head and limbs, with sensation of coldness. Six days ago got wet, and remained in her damp clothes all day. She sat for some time in a damp cellar, where her parent lived, and, on the following morning, had a severe "shivering fit." From this time she became gradually worse, and, when admitted, there was occasional low delirium, with constant dull aching pain in the forehead; slight deafness; pulse 92, and weak; respiration short and hurried; skin hot and dry; face flushed; conjunctivæ congested; tongue coated with dry, brown fur, with transverse cracks; sordes forming on the teeth; anorexia; bowels constipated; urine scanty and high coloured.

℞. Quinæ disulph. gr. xv., acid. sulph. dil. ♏xv., aquæ puræ ℥iij. Misce, capt. ℥j., secundis horis. Milk diet.

Vespere.—Pulse 90, fuller; tongue less dry; headache much relieved; delirium less; bowels open.

13th. Slept well; headache gone; delirium gone; less thirst; tongue moist, and less furred; skin moist, and cooler; respiration more easy; pulse 83, full; takes a little food.

14th. Had a good night; no headache or delirium; thirst gone; tongue much cleaner, and moist; the cracks gone, and the sordes disappeared from the teeth; skin cool and natural; urine free; appetite good, and general appearance much improved.

From this day she rapidly gained strength, and was discharged cured on the 18th, not having taken any medicine after the first twenty-four hours.

Case 2. John Barnes, shoemaker, aged 39, admitted on the 12th of February, with the skin hot and dry, and numerous rose coloured spots; low, muttering delirium; partial deafness; trembling of the limbs; congestion of the eyes, and severe pain in the head; loss of power in the limbs, and complaining of "sinking about the heart;" pulse 94, very small; respirations 34, and laborious; tongue dry and loaded with brown fur; great thirst; anorexia; bowels regular; urine scanty and high-coloured. Milk diet.

℞. Disulph. quinæ gr. vj. 3tis horis.

13. Slept for several hours; delirium gone; tongue moist, and less furred; thirst diminished; skin cooler, and moist; pulse 90, fuller; respirations less frequent; urine more plentiful; has taken a little food.

Continue the quinine.

14th. Continues to improve; rose-spots quite gone; skin cool; no thirst; tongue clean; appetite good; bowels acted freely.

Continue the quinine.

From this time he improved very rapidly; on the 16th was put on generous diet; on the 24th was discharged remarkably strong, and expressed himself as well able to work.

Case 3. John Mollin, labourer, aged 29, was admitted on the same day as the last case, and with nearly similar symptoms. He had, however, in addition, extensive pneumonia of the right lung.

℞. Quinæ disulph. gr. vj. 3tis horis.

On the second day after admission, the typhoid symptoms abated, the fever assuming a more inflammatory type, and the pneumonia becoming more active. On the fifth day, the quina was discontinued, and antimony, calomel, and opium resorted to for the pneumonia. On the second day of this treatment he died.

A post-mortem examination showed the whole of the right and the lower part of the left lung in a state of hepatization, the rest of the viscera quite healthy.—*Med. Times and Gazette, April* 23, 1853, *p.* 422.

152.—FIBRINO-ALBUMINOUS DIATHESIS.

By Dr. Ogle.

Dr. Ogle presented to the notice of the Pathological Society one or two specimens removed from patients in whom there had existed what may be termed a "Fibrino-albuminous Diathesis;" *i. e.*, a general tendency to the deposition of a fibrine-like substance in various parts of the body, in the same manner that we have a proneness to the deposition of carcinomatous or scrofulous substance, or the lithates in the gouty, the scrofulous, or the cancerous diathesis. The specimens brought forward were as follow: Portions of two hearts, in which, along with manifestations of the tendency in other parts of the body, the columnæ carneæ of the left ventricle were to a considerable extent consolidated and rendered opaque, and especially so at their apices, partly by conversion of the muscular substance itself into fibrous tissue, and partly by the presence of the same tissue between the muscular fibres; also a portion of the capsule of a spleen, which was quite opaque, and the greatest part of which was also extensively thickened, even to the extent of about half an inch, having assumed quite the consistence of cartilage, and containing also calcareous matter; also a portion of the colon, which, throughout all its coats, was exceedingly thickened and consolidated, having attached to its inner surface a thick coating of firm granular fibrine, in parts removable only with difficulty, and obviously of long standing. This last specimen was very interesting, as being somewhat rarely found. The entire colon, the rectum, and the lower half of the ileum, were similarly affected. The woman, aged 26, had been subject to occasional œdema of the integuments for ten years, but for two weeks had had much cough and dyspnœa. When admitted into St. George's Hospital, the lips and face were dusky and blueish, the pulse was feeble, the tongue coated, and the heart's impulse great, and along with the systole was a murmur of some intensity, heard chiefly at the apex. The urine was highly albuminous, and, three days after admission, complaint was made of pain at the cardiac region, and a pericardial friction sound was heard. Counter-irritation and purgatives were resorted to. Subsequently, epistaxis and vomiting came on, and about a week before death diarrhœa and pain in the abdomen, with dark-coloured offensive evacuations, set in; typhoid symptoms supervened, and she died about one month and a few days after her admission into the hospital. On *post-mortem*

examination, there was found a contracted, indurated, and lobulated condition of the kidney, with adherent capsules, and but slight distinction in aspect between the cortical and the pyramidal portions. There was also recent fibrine in the pericardial and in the peritoneal cavities, and much old adhesion in the pleural layers. The heart was hypertrophied, but quite natural as to the valves, orifices, &c. The suggestion of a "fibrino-albuminous diathesis," in connexion with which the specimens were adduced, was alluded to at p. 356 of the 'Transactions' of the Society for 1851-52. This general or universal condition appears so frequently to exist that it may deserve a somewhat prominent position in pathological considerations. It is often noticed that, in the course chiefly of asthenic disease, what is called a "low inflammation" of various parts of the body simultaneously exists, and after death it is found that the vessels of the affected part have given an outlet to a substance which acquires the name of "recent lymph." For the most part, no actual pain is experienced, but the chief immediate symptoms are owing to the presence and mechanical interference of fluid which is thrown out along with the more solid parts. Ofttimes, along with the diffusion of this fibrino-albuminous substance into textures, or on to surfaces, chiefly the serous ones, it may be seen that solid and massive portions, with definitely marked outlines, exist in the viscera, and have received the name of "fibrinous blocks." These are not unfrequently seen in the spleen and kidney, sometimes in the liver, and occasionally in the heart, as shown by Dr. Ogle and others to the Society during the last session; but the pressure of these masses, which were doubtless deposited, in the first instance, in a fluid state, does not appear to be the result of, or dependent upon, an atheromatous state of the arteries supplying the affected organ; but when an atheromatous state of the arteries supplying the organ did exist, both this state and the condition of the viscera are to be attributed to a common cause; neither, again, can they be referred, as some have referred them, to portions of fibrine, which, on being deposited in distant parts of the vascular system, have been carried along in the circulating stream, and lodged in the affected organ. The atheromatous condition of blood-vessels seems to be owing to this general diathesis or tendency alluded to, and perhaps is, on the whole, the most destructive and most important manner in which it manifests itself. It is very formidable on many accounts, for it is probable that, in addition to the formation of aneurisms by rupture of stiffened and resisting arterial tunics, &c., and also to more general dilatations, affecting most seriously the heat thereby, it gives rise, in most cases, to so-called cerebral, spinal, pulmonary, or other apoplexies, for these latter seem owing proximately to the rupture of minute vessels which have become inelastic and rigid; and this inelasticity seems to be the result of albumino-fibrinous elements of the blood, eliminated either within the vessels themselves or without them, and which have subsequently undergone fatty or calcareous degenerations. In some cases, as Mr. Barlow, of the Westminster Hospital, had suggested to Dr. Ogle, the fatty matter might be owing to direct conversion of the tissues of the vessels, without having, as it were, passed through the albumino-fibrinous stage. It is quite possible that at times this might be the case, as we often see

in the fibres of the heart, but very frequently, as might be observed in a preparation of a portion of an atheromatous artery dissected and shown along with the foregoing specimens to the Society, the deposit was so large in quantity and so thick, that, in this instance at least, it seemed highly improbable that its presence could have depended on the simple conversion of the natural tissues. Various diseases and disorganisations of viscera, independent of the presence of solid portions of fibrine-like substance within them, seem to originate in this tendency or diathesis. No better example of this peculiar diathesis could be selected than is afforded by Bright's disease of the kidneys, as it exists in many instances. Such disease seems to be the result of a peculiar state of the blood, under which a liability to the deposition of fibrine-like material is established within the organ, either diffused throughout its texture or deposited in solid masses in particular spots; not unfrequently it invades the epithelium cells, which are seen under the microscope to be large, crowded, and full of a yellow so-called protein compound, which is sometimes met with in the urine during life under the form of "fibrinous casts." The liver, again, affords a common instance of the same deposition, the frequent induration, the consolidation, and cirrhosis, or knotted condition, being, no doubt, often due to the presence of fibrine. As an exhibition of the same tendency, we have also the opacity and thickening of the various capsules and membranes within the body, as the capsule of the liver, of the spleen, patches of opacity on the pleural and pericardial serous membranes, thickening and opacity of the membrane forming the endocardium and valves of the heart, also old adhesions of various membranes. In this idea, Dr. Ogle was so fortunate as to have the concurrence, at least in part, of Dr. Handfield Jones, who, in a paper on "Cholagogue Medicines," read before the Medico-Chirurgical Society, had advocated a similar tendency in connexion with diseases of the liver and "stiffening" of various membranes.—*Med. Times and Gazette, Dec.* 18, 1852, *p.* 630.

153.—CASE OF RHEUMATIC PERICARDITIS AND PNEUMONIA.

By Dr. R. B. Todd, F.R.S., &c.

[Some peculiar phenomena presented themselves in this case, though the lesions were early and fully recognised. The patient was an Irishman, aged 20, and admitted into King's College Hospital, January 27, 1851. Symptoms of a severe attack of rheumatic fever came on five days before admission. The left knee-joint was the most affected, considerable effusion having taken place in it.]

There was no satisfactory cause for this attack, as the patient had not been exposed to cold in any way, and had been in excellent health just previous to its occurrence. He was a strong and well-nourished man, and did not appear by any means a bad subject for the malady. On the day (28th) after our patient's admission it was observed that his breathing was embarrassed and quickened. And when we came to examine him, we found evidence of the existence of pneumonia affecting

the posterior part of the lower lobe of the left lung, in which situation there was dulness on percussion, and the breathing was bronchial, while the vocal vibrations were felt by the hand applied to the wall of the chest. He was treated in the ordinary way. A gentle purgative was administered, turpentine stupes were applied to the chest, and afterwards a blister was put on. The joints were wrapped up in cotton wool covered by oiled silk, and he had ten grains of Dover's powder at bed-time.

On the 29th, our attention was attracted to a peculiarity in the pulse, which having been hitherto at 108 and 100, had now fallen to 92, and had become intermittent. This change of pulse excited my suspicion that there was something wrong about the heart, as we seldom in such cases find a sudden change in the character of the pulse without there being some mischief commencing in that organ. For this reason the state of the pulse is often a most important guide in rheumatic fever, and any sudden change in it, whether it be from quick to slow, or *vice versâ*, or whether from being steady and regular it becomes vacillating and intermitting, should instantly direct your attention to the heart. There is the greatest variety in the way in which inflammation disturbs the heart's action, in some cases depressing it and causing it to vacillate and intermit; in others creating considerable acceleration of it. In this case the heart's action became decidedly intermittent, and upon examination a faint rubbing sound was heard at the base of the heart. There was also some suspicion of the existence of a bellows-sound at the heart's apex; but as the sound was extremely faint, it was impossible at the time to decide whether it was a faint bellows sound or a friction sound. The subsequent course of the case leaves no doubt that it was the latter. I notice the fact here to found upon it a remark, that it is often very difficult, or even impossible, to determine between a bellows murmur and a friction sound. I have no doubt that a faint sound of the latter kind is often mistaken for a bellows-murmur, and has probably led some physicians to assign to endocarditis a greater frequency of occurrence than it can justly claim. So far we had only the quality of the sound to rely upon—a feature by which an experienced ear will often have no difficulty in determining its true nature, but which is far from affording unequivocal evidence. However, as the case went on, we were able to obtain other characters more easily appreciated and more generally to be relied upon.

There was, then, up to this point, quite sufficient evidence of the existence of pneumonia and pericarditis. Let me remark here, that pneumonia is more frequent in rheumatic than in other constitutions, and is now fully recognised as one of the complications of rheumatic fever, for which the practitioner must keep on the look out. The rheumatic pneumonia is apt to attack both lungs; it has likewise a disposition to wander, appearing in one part of the lung, then leaving this, and invading another portion. In this patient both these features were present; the pneumonia disappeared from the base of the left lung, and attacked a circumscribed region on both sides, situated a little below the spine of the scapula, and extending to within a short distance of the vertebral column.

To complete the signs of pneumonia in this case, we found that our patient expectorated sputa, which were very viscid, and were tinged with the rusty colour so characteristic of pneumonic expectoration. The treatment hitherto adopted consisted in counter-irritation by turpentine stupes applied freely over the posterior surface of the chest, and by a blister placed on the region of the heart. He was well purged with carbonate and sulphate of magnesia, and took a grain of opium, with nitre and ipecacuanha every four hours.

On the 30th of January, the physical signs already described had become more distinct. The rubbing sound was louder, and exhibited at once the peculiar roughness, as well as the "to-and-fro" character, by its accompanying both systole and diastole. All indication of a bellows-murmur had now disappeared. The signs affecting the lungs began to improve, and there was distinct evidence that resolution was taking place; coarse crepitation was audible where the bronchial breathing had been heard, and the sputa were less viscid, but the signs of oppression of the heart had increased. The respirations were more frequent, and of a catching character. He was now breathing 44 times in a minute, and each inspiration was accompanied with a peculiar catching movement of the diaphragm, as in hiccough; but there was ample evidence that the air entered the greater part of both lungs. In the lower part of each side, particularly behind, we detected a moist crepitation accompanying both inspiration and expiration; and when the hand was placed over this part of the chest, a peculiar rough and vibratory sensation was distinctly perceived, such as would be caused by two rough surfaces moving the one upon the other. The crepitation was at first very moist in character, and it became a question whether it was intra-pulmonary, and due to the passage of air through moist secretion in the bronchial tubes, or whether it depended upon the presence of moist lymph on the surface of the pleura. Sometimes large flakes of loose moist lymph are formed on the surfaces of the pleural membrane, and, by the rubbing of such flakes together, a sound is generated very like the large crepitation which occurs in bronchial tubes filled with mucus. And, in some instances you will find it very difficult to distinguish the one from the other. Generally speaking, the pleuritic rubbing accompanies both inspiration and expiration, while the bronchial crepitation either accompanies inspiration only, or is much more intense during inspiration. In the present case, the sound was equally distinct with inspiration and expiration, and soon lost its very moist character, assuming the creaking nature of the friction-sound. Thus we now found an additional complication in the case,—a pleural rubbing sound had made its appearance, and was accompanied with respiration of a peculiar catching character, as if the diaphragm was impeded in its action. And there was, likewise, not only that remarkable expression of restraint which the countenance is so apt to assume when the pericardium is affected, but it now exhibited somewhat of the sardonic-grin, which, accompanying the catching movement of respiration, led me to infer that the pleurisy at the lower portion of each side had extended to the diaphragm. We had then, in addition to the pericarditis, pleurisy; and not only so, but the distressing and dangerous form of diaphragmatic pleurisy.

The symptoms of irritation of the diaphragm, however, soon subsided, and for some days matters seemed to go on well. Our patient had been put upon mercury (calomel and opium) and the blistered surfaces were dressed with mercurial ointment. In the course of six days his gums became sore, and the usual fetor affected the breath. This, under ordinary circumstances, I should have regarded as a favourable sign, since in general, when the pericardial inflammation is very extensive we do not find the mercury take hold of the system so quickly; however, in this case the speedy action of the mercury might have been attributed to some degree of disease of the kidney, for albumen was present in increasing quantities in the urine.

The symptom which now became most distressing to our patient was quick breathing. The number of respirations never fell below 32, was generally 40, but on the slightest exertion it would rise even as high as 70. This was partly to be attributed to his temperament, which was highly nervous and anxious. He was extremely impatient of pain, and was exceedingly restless and hard to please. It was not caused by anything wrong with the lungs, for the pleuro-pneumonic signs had greatly abated; it was mainly referrible to the state of the heart. There was an increased extent of dulness over the precordial region, chiefly towards the right side, and this I attributed to some amount of fluid effused into the pericardium; but you will remember that I stated that this could not have been very extensive, as the friction-sound continued to be audible at the heart's apex as well as at its base. Now, you may still continue to hear a pericardial friction-sound at the heart's base, notwithstanding the presence of fluid in the pericardium; but such will not be the case at the apex, for this will be pushed back by fluid accumulating in the bag, and away from contact with the parietal serous layer, unless there have been some previous band of adhesion stretching between the two surfaces. For this reason, I felt certain that as yet no great amount of liquid effusion had taken place, but there was too much reason to fear that the surface of the heart, in front at least, was covered with lymph.

A new sign now attracted our attention, and puzzled us not a little, and ultimately led me somewhat astray in diagnosis. On the 7th Feb. we found great resonance of the lower half of the left side of the chest behind: in fact, it had become tympanitic, and there appeared to be a bulging of the walls of the chest in this situation. Upon listening over this region, we heard a sound resembling that produced by air passing through liquid and creating a succession of bubbles, which broke upon the surface with a metallic sound,—this sound was synchronous with and apparently caused by inspiration. The chest was likewise tympanitic on percussion at the left side in front, and in the lateral region. Metallic tinkling was very manifest over the whole of the lower part of this side of the chest on succussion.

Now a highly tympanitic state of chest coming on suddenly, or with great rapidity, naturally suggested the idea of air getting in some way into the pleural cavity. This might take place either by the rapid secretion of air in that part, or by the rupture of a small abscess of the lung, and the perforation of the pulmonary pleura, through which air

would readily pass at each inspiration into the cavity. But there was one sign absent in this case, which must of necessity have occurred, for a time at least, if a perforation existed, namely, amphoric blowing,—a sound precisely resembling that caused by blowing air into a glass jar containing air and water.

Had the signs which I have enumerated,—namely, the tympanitic percussion sound, and the gurgling and metallic tinkling been found on the right side, they could not have been explained otherwise than on the supposition, that air and fluid existed in the sac of the pleura, or in some large thin-walled excavation of the base of the lung. But these signs were on the left side; and here, you will bear in mind, is the stomach, which, when large and distended with air, may push up the diaphragm very much, so as to incommode the heart, and interfere with the freedom of its action. A large and dilated stomach, well filled with air, will render the lower third or fourth of the left chest tympanitic, and if it be partially filled with liquid it will give metallic tinkling on percussion. Now, our patient was just the subject in whom we might expect phenomena such as these to be caused by the stomach. He was one of the hard-working, ill-fed class of Irish labourers, who, living chiefly on potatoes, and taking a good deal of liquid also, are apt to have very large stomachs, in which wind is largely generated, and accumulates to a considerable extent. There is no doubt that we might have rested content with this explanation of the signs in question, and more especially as the tympanitic state remained confined to the lower part of the chest in the semi-erect posture, and as there was no displacement of the heart, which invariably takes place when any considerable quantity of air or fluid is effused into the left side of the chest.

The question then was, were these signs, the metallic tinkling, the gurgling, the tympanitic state of the lower part of the left chest, due to air and fluid in the cavity of the pleura, or to air and fluid on a large and dilated stomach. Although I made no positive diagnosis, I confess I leaned much to the former view. The gurgling was so clearly connected with inspiration, as well as with expiration,—a phenomenon which I had not previously noticed thus associated,—and the tympanitic state ascending so high in the chest, that I could not satisfy myself that these signs could arise from a dilated stomach containing air and fluid. And the absence of the other signs to which I have alluded admitted of some explanation. Thus, the pleurisy which we had already recognized, by causing a line of adhesion between the pleura, would have impeded the ascent of the air, and thus limited the tympanitic state to the lower part of the chest; the same cause, by confining the air within a circumscribed cavity, would prevent displacement of the heart; and, furthermore, the absence of amphoric blowing might be accounted for by supposing that the fistulous opening became plugged up soon after its formation.

The case was further complicated by the occurrence just at the time these signs appeared, of a profuse purulent expectoration, precisely such as might have come from a pneumonic abscess pent up in the substance of the lung. We were not kept very long in suspense as regards the explanation of these signs. Our patient began to show evident indica-

tions of a failure of vital power. He sweat profusely; his pulse became very rapid and weak, and ultimately intermittent and irregular, and his dyspnœa increased, and he died on the 13th. The only new sign connected with the breathing which occurred was this: that on the 11th we found that, close to the inferior border of the scapula, bronchial breathing of a metallic character was audible over a space about the size of a crown piece.

We proceeded to the *post-mortem* inspection with not a little curiosity, to ascertain how far the diagnosis was correct. Let me here remind you what that diagnosis was. We made out then, *first*, pericarditis with extensive effusion of lymph; *secondly*, effusion of liquid into the pericardium, but not such as to remove the apex of the heart from contact with the parietal layer of the serous pericardium; *thirdly*, pleurisy at the base of both lungs, with lymph on the pleura in that situation, and also to some extent on the diaphragmatic pleura; lastly, it was conjectured that air had formed or escaped from the lung into a cavity circumscribed by lymph within the pleural sac, and was partially filled with liquid. Before the body was opened, percussion was made over the chest in the region which had been tympanitic during life. It was found that the tympanitic state had disappeared. A puncture was next made in one of the intercostal spaces on the left side, but there was no escape of either air or liquid. It was plain, then, that the last part of the diagnosis was incorrect. I shall explain by and by how the phenomena which we noticed during life were produced.

On opening the chest in the usual way, we found the pericardium distended in great part with fluid. As much as fourteen ounces of bloody serum were obtained from it. The whole heart, both in front and behind, was covered by thick, rough lymph, with numerous papilliform processes projecting from it, and the corresponding surface of parietal pericardium was in a similar condition. The apex and great part of the left edge of the heart were adherent to the parietal layer of the pericardium. For this reason the fluid was forced to the right side, and lay upon and compressed the right ventricle.

I show you here the preparation, from which you will see how firm was the adhesion of the heart to the pericardium on the left side. It was owing to this cause that we continued to hear the friction sound, notwithstanding the presence of the fluid in the sac. The quantity of the effusion exceeded my expectations, and certainly the extent of the dulness on percussion did not justify the supposition that a very large accumulation of fluid had taken place. The adhesions on the left side prevented the fluid from spreading to that side, and caused it rather to push the heart back into the posterior mediastinum, and upon the left lung. It is probable likewise that a large part of the effusion took place during the last few days of life. No careful examination of the heart had been made since the 9th (four days before his death), and on that day it was observed that the heart's sounds were muffled.

The effusion of lymph was not confined to the anterior surface of the heart; it covered the posterior surface likewise. So great was the accumulation of fluid in the pericardium, and so much did it press backwards, that a portion of the left lung was found much compressed, and

pushed upwards and backwards. The compression was sufficient to produce, in the portion of lung pressed on, that condition which Laennec describes under the name of *carnification*, in which, by prolonged compression the air is expelled from the air-cells, and the lung assumes a non-crepitant, solid, fleshy character. This condition is the same as that which is produced by the compression of a pleural effusion. It was but a small patch of the lung that was thus carnified, and that corresponded to the situation in which we heard bronchial breathing on the 11th.

The pleuræ on both sides had several patches of thin lymph on them, especially over the lower lobes, and the diaphragmatic pleura was likewise similarly coated, that portion on the right side exhibiting the thickest layer of lymph. The bronchial mucous membrane was very highly congested, and as red as velvet, and the tubes were filled with mucopurulent fluid, like what he expectorated.

Thus, then, in all the main points, the diagnosis was correct. It failed, however, to explain the tympanitic state of the lower part of the left chest, and the gurgling and tinkling heard there. All these signs were due to the stomach, which, as we expected, was a very large one. The diminished size of the left lung, owing to its compression by the large heart and distended pericardium, probably allowed the stomach to ascend into the chest higher than it was wont; and the adhesion of the diaphragm to the pleura covering the base of the lung, permitted the movements of the chest to be communicated more readily than is usual to the stomach, giving rise to the gurgling which accompanied inspiration and expiration, and to the metallic tinkling which we so often heard.

I think that, in this instance, the error of diagnosis, or, rather, the passing over the right one, was due to my not having attached its full share of importance to the absence of amphoric breathing. The proximity of a large stomach generally distended with a large quantity of air, and always containing more or less fluid, afforded a sufficiently obvious explanation of the phenomena, and which I should most probably have adopted were it not that the tympanitic state reached so high up in the chest. On another similar occasion, a fair test of the formation of the tinkling sound in the stomach may be obtained by applying the ear to the lower part of the chest while you make the patient swallow, and comparing the sound thus produced with that caused by succussion, and by the forcible movement of the chest.

You will not, I am sure, complain that I have dwelt so long upon this highly interesting case. It cannot fail to prove most instructive to all who have carefully studied and watched it. None of us will, I think, hereafter be likely to overlook the importance of a large windy stomach in generating sounds similar to those caused by the presence of air and fluid in the pleural sac.

Now, as to the treatment. This, as you know, was by opium, purgatives, and blisters in the first instance, to which was soon added the exhibition of mercury in full doses. Counter-irritation was used freely to various parts of the chest; and, latterly, when the patient's powers seemed to fail, wine was given in very moderate quantities.

There are some who would say that free bleeding adopted early would have stopped the pericardial inflammation at once, and so have saved the patient. The answer to this is as follows: namely, that many cases have been bled, both largely and early by others as well as myself, and that the result has not been more favourable than in this instance; the patient has died with quite as great a coating of lymph on the heart, and quite as much or more effusion into the pericardium. Indeed, I have a strong opinion that large bleedings favour liquid effusions; they make the blood more watery, and, by diminishing its coloured particles, impair the vigour of its vital changes.

Again, you will ask, why I did not try local bleeding over the region of the præcordia. To this I reply, because in many previous trials I have found it inadequate to the object in view. If you will take the trouble to refer to a work which I published some years ago upon 'Rheumatic Fever and Gout,' you will find that I there advocated the application of leeches and blisters over the region of the heart. Since that time, I have learned by large experience to trust to the latter only, and have abandoned very active antiphlogistic treatment in these cases, as being not only ineffective, but mischievous.

As you know, we gave mercury very freely,—a treatment which, although perhaps not always *necessary*, I think ought to be pursued in severe cases, as I cannot doubt that the free administration of mercury tends to limit the effusion of lymph, and also to promote its absorption. Opium was given with the calomel, in frequently-repeated doses. Opium relieves pain, checks the extension of disease, and quiets the nervous system in many forms of serous inflammations. It is of paramount importance in the treatment of peritonitis, and acts very favourably in inflammation of the pleura and pericardium. Free counter-irritation was also adopted here; large blisters were applied to the chest and to the region of the heart, and turpentine stupes were frequently had recourse to.—*Med. Times and Gazette, Dec.* 18, 1852, *p.* 611.

154.—ON TUMOURS.

By James Paget, Esq., Professor of Anatomy and Surgery to the Royal College of Surgeons.

[We have long been desirous of giving to our readers the following abstracts of Mr. Paget's Lectures on Tumours, as they form the most interesting essays on the subject with which we are acquainted; but hitherto our space has been too much occupied by shorter papers. In this volume, however, we find that we can afford room for them.]

Classification of Tumours—Their distinction from adapted hypertrophies, and from those connected with inflammatory exudations; their property of independent growing; their independence in development, maintenance, and degeneration. Relation of tumours to certain hypertrophies of organs, and especially of the thyroid and other glands: their arbitrary distinction from these.—The class of diseases which includes the tumours may be reckoned as a part of the great division named

Hypertrophies or Overgrowths. All its members consist in additions to the organised materials of the body, and appear to be expressions of a morbid excess of its formative force; but, in the case of each hypertrophy, the mode is peculiar in which this excess is manifested. If we compare any tumour with one of the hypertrophies that are least morbid —with one of those, for instance, in which the excessive growth is adapted to some emergency of disease, as an hypertrophy of the heart is adapted to some emergency of the circulation—we shall, I believe, always see between them this chief difference; that, to whatever extent the adapted hypertrophy may proceed, the overgrown part maintains itself in the normal type of shape and structure; while a tumour is essentially a deviation from the normal type of the body in which it grows, and, in general, the longer it exists the wider is the deviation. A striking illustration of this contrast may be found in some of the cases of fibrous tumours that grow into the cavity of the uterus. Such a tumour may resemble in its tissues the substance of the uterus itself, having well-formed muscular and fibrous tissues; and, so far as the structures formed in excess are concerned, we might regard the tumour as the result of an hypertrophy not essentially different from that which, at the same time and rate, may take place in the uterine walls around it. But an essential difference is in this—the uterus, in its growth around the tumour, maintains a normal type, though excited to its growth, if we may so speak, by an abnormal stimulus: it exactly imitates, in vascularity and muscular development, the pregnant uterus, and may even acquire the like power; and at length, by contractions, like those of parturition, may expel the tumour, spontaneously separated. But the tumour imitates in its growth no natural shape or construction: the longer it continues the greater is its deformity. Neither may we overlook the contrast in respect of purpose, or adaptation to the general welfare of the body, which is as manifest in the increase of the uterus as it is improbable in that of the tumour.

Herein we seem to discern an essential difference between the overgrowths of tumours and those accomplished by any exercise of the normal reserve-power of nutrition in a part. This power, capable of acting in any emergency, is not a mere capacity of production, neither is it dependent upon circumstances for the fashion of its products; identical with that which actuated the germ, it is equally bound to conformity with the proper type of the part or species in which it is exercised.

An equal contrast may, in general, be drawn between the class of diseases that includes tumours, and all the others that issue in a morbid excess of nutritive formation. We may take, as the example of these, the inflammatory diseases attended with exudation, and say (reserving certain conditions) that in these there is an excessive exercise of formative force—an hypertrophy. But between such diseases and tumours we shall rarely fail to observe the following differences:—1st. The accumulation of lymph in inflammation appears chiefly due to the morbid state of the parts at or adjacent to the seat of exudation. We have, I think, no evidence that the lymph of inflammation increases by any inherent force—any attraction of self-organising matter, or any multiplication of its own cells; but the increase of all, or nearly all, tumours, is

"of themselves:" they grow as parts of the body, but by their own inherent force, and depend on the surrounding parts for little more than the supply of blood, from which they may appropriate materials. A tumour, therefore, as a general rule, increases constantly; an inflammatory exudation generally increases only so long as the disease in the adjacent parts continues.

2d. The materials severally produced in excess, in these two cases, have different capacities of development. The inflammatory exudation, in whatever part it lies, has scarcely more than the single capacity to form fibro-cellular or fibrous tissue: the material that begins or is added to a tumour may, indeed, assume either of these forms, but it may assume any one of several other forms.

But, 3rdly, the most striking contrast is in the events subsequent to this first organising of the two materials. The later course of organised inflammatory exudations, like that of the organised material for repair after injuries, is usually one of constant approximation to a healthy state. As newly formed parts, they gradually assimilate themselves to the shape and purpose, if not to the tissue, of the parts among which they lie; or they are apt to waste, degenerate, and be removed. Their progress is ever towards a better state; so that, in the whole course of exudative inflammatory diseases, some can see nothing but an "effort of nature" to avert or repair some greater evil. It is very different with the class of diseases to which tumours belong: it is in their very nature to proceed to further and further deviation from the proper type of the body. The structure of tumours may, indeed, be like that of some of the natural parts; it may be identical with that of the part in which they lie: in this they may be homologous; but, considered in their life, they are not so; for, commonly, they are growing while the tissues far and near around them are only maintaining their integrity, or are even degenerating, or yielding themselves to the anormal growth.

I think that it is only in the consideration of this activity and partial independence of the life of tumours, and of the diseases allied to them, that we shall ever discern their true nature. We too much limit the grounds of pathology when, examining a tumour after removal, we only now compare it with the natural tissues. The knowledge of all its present properties may leave us ignorant of the property which it alone, of all the components of the body, had some time ago,—the property of growing. And so, if we can ever attain the knowledge of the origin of a tumour, it may avail little, unless it supply also the explanation of its progress. If, for example, what is very improbable could be proved—namely, that tumours have their origin in the organisation of extravasated blood, or of inflammatory exudation, still this greater problem would remain unsolved:—How or why is it, that, in ordinary cases, these materials, when organised, gradually decrease, and assimilate themselves to the adjacent parts; while, in the assumed formation of tumours, they gradually increase, and pursue, in may cases, a peculiar method of development and growth? Why is it that, assuming even a similarity of origin, the new-formed part manifests, in the one class of cases, a continuous tendency towards conformity with the type of the body—in the other, a continuous deviation from it in shape and volume, if not in

texture? How is it that, to take an extreme case, we can ever find, as in a specimen at St. George's Hospital, fatty tumours of considerable size in the mesentery of a patient from whom, in the extremest emaciation of phthisis, nearly all the natural fat was removed.

I do not pretend to answer these questions; but I think that in them is the touchstone by which we may tell the value of a pathology of this great class of diseases. It is not in the likeness or the unlikeness to the natural tissues that we can express the true nature of tumours: as dead masses, or as growths achieved, they may be called like or unlike the rest of a part; but, as things growing, they are all unlike it. It is, therefore, not enough to think of them as hypertrophies or overgrowths: they must be considered as parts overgrowing, and as overgrowing with appearance of inherent power, irrespective of the growing or maintenance of the rest of the body, discordant from its normal type, and with no seeming purpose.

To all this, I know, it may be objected that tumours, and other like growths, may cease to grow, or grow unequally, and yet are tumours still. But this is only in appearance opposed to what I have said, which is no more than that the best or only period, in which we may discern the true difference of these from other growths, is the period of their active increase. As we can have no complete idea of any living thing, unless it include the recognition of its origin, and of its passage through certain phases of development and growth; so must our thoughts of these abnormities be imperfect or untrue, unless we have regard to their development, and growth, and maintenance, as independent parts. But, indeed, the cessation of growth in tumours and the allied diseases often affords evidences of their peculiar nature, confirmatory of that deduced from their increase. Such cessation may occur when they have attained a certain regular size; as in the painful subcutaneous tumours, the osseous tumours on the phalanges of great toes, and some others, which, perhaps always, cease to grow when they have reached a limit of dimensions, that appears as natural and constant for them as the average stature is for the individuals of any species. Or, the cessation of growth may occur when the tumour degenerates or wastes; as when a fibrous tumour calcifies, or when a mammary gland tumour is absorbed. But it is to be observed that these events are, or may be, as irrespective of the nutrition of all the rest of the body as the development and growth of the tumour were; and that, except in the comparatively rare event of the absorption of a tumour, there is in no case an indication of return to the normal type or condition of the body: there is no improvement, as in the organised exudations of the inflammatory process, no adaptation to purpose, no assumption of a more natural shape. In all these events, therefore, as well as in their growth, the nearly independent nature of the tumour is shown: while forming part of the body, and borrowing from it the apparatus and the materials necessary to its life, the tumour grows, or maintains itself, or degenerates, according to peculiar laws.

The characters of which I have been speaking belong to a larger number of abnormities than are usually called tumours: they belong, indeed, to a large class, of which tumours form one part or section; and another part is composed of certain morbid enlargements of organs by what is re-

garded as merely hypertrophy,—such as that of the prostate, the thyroid gland, and others. Now the distinction between these two divisions of the class must, I believe, be an arbitrary one; for the two are so little unlike, that, really, it is in these hypertrophies of glands that we may hope to find the truest guidance to an insight into the nature of tumours.

In speaking of cysts from the walls of which vascular growths may spring and fill their cavities, I shall have to describe that these intra-cystic growths are, in their best state, close imitations of the gland in which they occur. In relation to tumours, the most instructive examples of this fact are in the cystic tumours of the breast, of which the general structure has been illustrated by Dr. Hodgkin and Sir B. C. Brodie, and the microscopic character by M. Lebert and Mr. Birkett. Among these, a series of diagrams, from specimens in the Museum, may illustrate the transition from the simple cyst to the cyst so filled with gland-substance as to form a solid tumour,—the chronic mammary, or mammary glandular tumour. Now a near parallel with the history of these mammary tumours is presented by the observations of Frerichs and Rokitansky on the intra-cystic growths which occur within the substance of enlarging thyroid glands,—*i. e.*, of increasing bronchoceles. In these, masses of new-formed thyroid gland-tissue are found imbedded, and inclosed in fibro-cellular coverings or capsules, within the proper, though increased, substance of the gland. In like manner, as Rokitansky has shown, it is not unusual, in enlargements of the prostate gland, to find distinct masses of new structure imitating that of the prostate, which lie imbedded and incapsuled in the proper substance of the gland. Moreover (and here is a closer contact between these hypertrophies and tumours), these growths of new gland-tissue may appear not only in the substance of the enlarging thyroid and prostate glands, but external to and detached from the glands. Such outlying masses of thyroid gland are not rare near bronchoceles; lying like the little spleens one often sees near the larger mass. Near the enlarged prostate, similar detached outlying masses of new substance, like tumours in their shape and relations, and like prostate gland in tissue, may be sometimes found. I have here a very large and remarkable specimen of the kind, sent to me by Mr. Wyman. It was taken from a man, 64 years old, who, for the last four years of his life, was unable to pass his urine without the help of the catheter. He died with bronchitis; and a tumour, measuring $2\frac{1}{2}$ inches by $1\frac{1}{2}$, was found, as Mr. Wyman described it, "lying loose in the bladder, only connected to it by a pedicle, moving on this like a hinge, and, when pressed forwards, obstructing the orifice of the urethra." Now, both in general aspect and in microscopic structure, this tumour is so like a portion of enlarged prostate gland, that I know no character by which to distinguish them.

The relation of these new-formed isolated portions of the thyroid or prostate gland is so intimate, on the one side, to admitted tumours,—such as the chronic mammary,—and, on the other side, to the general hypertrophies of the glands, that we cannot dissociate these diseases without great violence to nature. Clearly these are all essentially the same kind of disease: yet, to call them all "tumours" would be to do as

much violence to the conventional use of terms which have become not merely the expressions, but the guides, of our thoughts. The best course seems to be to make an arbitrary division of this group. In accordance, then, with the arbitration of custom, we may assign the name of tumours to such examples of these morbid growths or growing parts, as, 1st, are isolated from the surrounding parts by distinct investing layers of tissue; or, 2dly, are continuous with the natural parts, but are abruptly circumscribed in the greater part of their extent; or, 3dly, are formed of new materials infiltrated and growing in the interstices of natural parts.

Division of tumours into innocent and malignant.—Characters of malignant tumours: (a) *assumed heterology of texture;* (b) *infiltration;* (c) *proneness to ulceration;* (d) *peculiarities of the ulcer;* (e) *multiplication and reproduction;* (f) *indifference to locality.*—If the group of what are to be called tumours may be thus inclosed, we may next proceed to divide it into smaller parts. And, first, it seems proper to divide tumours according as they may be named *innocent* or *malignant.* I would employ these terms still, because, though not free from objections, they imply a more natural and a less untrue division than any yet invented to replace them. The distinction between innocent and malignant tumours is probably one not of mere visible structure, but of origin and of vital properties; it is, therefore, less falsely expressed by terms implying quality of nature, than by such as refer to structure alone.

I shall not be able in these lectures to describe malignant tumours. It may suffice, for the present, to illustrate those characters which may be generally deemed distinctive of malignancy; while their absence, or the existence of their opposites, may be counted among the general characters of the innocent tumours which I propose more fully to describe.

And, first, the intimate structure of *malignant tumours* is, usually, not like that of any of the fully developed natural parts of the body, nor like that which is formed in a natural process of repair or degeneration.

Many of the cells of cancers, for example, may be somewhat like gland-cells, or like epithelium-cells; yet a practised eye would easily distinguish them, even singly. And much more plainly their grouping distinguishes them: they are heaped together disorderly, and seldom have any lobular or laminar arrangement, such as exists in the natural glands and epithelia, or in the innocent glandular or epithelial or epidermal tumours. These innocent tumours are really imitations, so far as their structure is concerned, of the natural parts; and the existence of such imitations makes the diversity—the heterology, as it is called—of the malignant tumours appear more evident.

Still, this rule of dissimilarity of structure in malignant tumours is only general. The other properties of malignancy may be sometimes observed in tumours that have, apparently, the same structure as those that are generally innocent. I shall have to refer to cases of fibrous tumours which, in every respect of structure, were like fibrous tumours of the uterus, and yet returned after removal, and ulcerated, with infection of adjacent parts, and appeared in internal organs. These, with some others, must be regarded as malignant, though in structure resembling innocent tumours and natural tissues. On the other hand,

there are some innocent cartilaginous tumours with structures that do not exist in any of our natural tissues. The two sets of cases, though both be exceptional, supply suffcient grounds for not preferring such terms as "homologous" and "heterologous" before "innocent" and "malignant," if they are meant, as they commonly are, to apply to the structure of the several growths.

2d. Malignant growths may have the character of infiltrations,—*i. e.*, their elementary structures may be inserted, infiltrated, or diffused in the interspaces and cavities of the tissues in which they lie. Thus, in its early state, a malignant tumour may comprise, with its own proper elements, those of the tissue or organ in which it is formed; and it is only in its later life that the elements of the tissue or organ disappear from it, gradually degenerating and being absorbed, or possibly yielding themselves as materials for its growth.

Thus a hard cancer of the mammary gland includes in its mass a part, or even the whole, of the gland itself, as if there were only a conversion of the gland-tissue: and one may find within the very substance of the cancer the remains of the lactiferous tubes involved in it, and, with the microscope, may trace in it the fibro-cellular tissue that separated the gland lobes, and the degenerate elements of the epithelial contents of the tubes and acini. But among all these lie the proper cells of the cancerous growth, and these usually increase while the original structures of the gland decrease. So, too, in medullary cancerous disease of the uterus, the uterus itself, or part of it, is in the tumour, and gradually wastes while the medullary matter diffused or infiltrated in it is growing.

The malignant growths may, I say, thus appear as infiltrations; but they are not always so. Thus, though the hard cancer of the breast is commonly or always, an infiltration of cancerous substance in and among the proper structures of the gland; yet the hard cancer of the bones is usually a distinct tumour, such as has no mixture of bone in it, but may be enucleated from the cavity or shell of bone in which it lies. So, too, while the medullary cancer of the uterus plainly consists in an infiltration or insertion of new material in the substance of the organ, that of the breast is usually a separate tumour, and altogether discontinuous from the surrounding parts.

Many other instances of similar contrast may be cited; still the fact that their elementary structures may be thus infiltrated in the tissues they affect is a characteristic feature of malignant tumours. I think it is never imitated in cases of innocent tumours.

3d. It is, also, generally characteristic of malignant tumours that they have a peculiar tendency to ulcerate, their ulceration being commonly preceded by softening. One can, indeed, in this particular, only observe a graduated difference between the innocent and the malignant diseases; for certain innocent tumours, if they grow very rapidly, are apt very rapidly to decay; and then may suppurate and discharge their pus and débris with foul and dangerous ulceration. Thus the quickly-growing cartilaginous tumours may imitate, in these respects, malignant growths; so may large fibrous tumours when they soften and decay. Or, again, when an innocent tumour grows more rapidly than the parts

over it can yield, they may waste and ulcerate, and allow it to protrude; and it may now itself ulcerate and look very like malignant disease. This may be seen in the protruding fibrous tumours that ulcerate and bleed; or, in a more striking manner, in the protruding vascular growths that have sprung up in the cystic tumours of the breast. Or, once more, the characters of readiness to ulcerate may be imitated by innocent tumours after injuries, or in exposure to continued irritation; for they resist these things with less force than the similar natural parts do. Hence, sloughing and ulcerating fibrous, erectile, and other tumours, have been often thought cancerous, and so described.

4th. The softening that often precedes the ulceration of malignant growths can hardly be considered separately from the minute account of their structure. I therefore pass it by, and proceed to their fourth distinctive character, which is to be noticed in the modes of their ulceration.

This is, that the ulcer, which forms in, or succeeds, a malignant growth, has no apparent disposition to heal; but a morbid substance, like that of which the original growth was composed, forms the walls or boundaries of the ulcer; and as this substance passed through the same process of ulceration which the primary growth passed through, so the malignant ulcer spreads and makes its way through tissues of all kinds.

5th. Malignant tumours are, again, characterised by this,—that they not only enlarge, but apparently multiply or propagate themselves; so that, after one has existed for some time, or has been extirpated, others like it grow either in widening circles round its seat, or in parts more remote.

Mere multiplicity is not a distinctive character of malignant diseases; for many innocent tumours may be found in the same person. But in the conditions and circumstances of the multiplicity there are characteristic differences. Thus, when many innocent tumours exist in the same person, they are, commonly, or always, all in one tissue. Thus a man may have a hundred fatty tumours, but they shall all be in his subcutaneous fat: many fibrous tumours may exist in the same uterus, but it is so rare, that we may call it chance, if one be found in any other part in the same patient: so, many cartilaginous tumours may be in the bones of the hands and feet, but to these, or to these and the adjacent bones, they are limited.

There is no such limitation in the cases of multiplicity of malignant tumours. They tend especially to affect the lymphatics connected with the part in which they first arise; but they are not limited to these. The breast, the lymphatics, the skin and muscles, the liver, the lungs, may be all, and at once, the seats of tumours. Indeed (and here is the chief contrast), it is more common to find the many malignant tumours scattered through several organs or tissues than to find them limited to one.

Moreover, if there be a multiplicity of innocent tumours, they have generally had a contemporary origin, and all seem to make (at least for a time) a commensurate progress. But the more ordinary course of malignant tumours is, that one first appears, and then, after a clear interval of progress in it, others appear; and these are followed by others, which, with an accelerating succession, spring up in distant parts.

6th. A sixth distinctive character of malignant tumours is that, in

their multiplication, as well as in their progress of ulceration, there is scarcely a tissue or an organ which they may not invade.

In regard to their multiplicity, I have just illustrated their contrast in this point with the innocent tumours; and a similar contrast is as obvious in the characters of the ulcers. It is seldom that a common ulcer extends, without sloughing, from the tissues it has first affected into any other; rather, as a new tissue is approached, it is thickened and indurated, as if to resist the progress of the ulcer. But before a cancerous ulcer the tissues in succession all give way, becoming first infiltrated, and then, layer after layer, degenerating and ulcerating away with the cancerous matter.

One may see this very well in bones. Specimens are to be found in nearly all museums, of tibiæ (for example) on the front surfaces of which new bone is formed, in a circumscribed round or oval layer, a line or two in thickness. This bone, which is compact, hard, smooth, and closely united with the shaft beneath it, was formed under an old ulcer of the integuments of the shin. But, on the other side, specimens are found, which show that when a cancerous ulcer reaches bone, at once the bone clears away before it; and a cavity with abrupt, jagged, eaten-out edges, tells the rapid work of destruction. Neither are specimens rare, showing the progressive destruction of more various tissues; such as a cancer of the scalp making way by ulceration through the pericranium, skull, and dura mater, and then penetrating deeply into the brain; or one in the integuments of the shin going right through the tibia, and deep into the muscles of the calf.

Such are the general characters of malignant tumours. Those of innocent ones are their opposites or negatives. Thus: no innocent tumours have a structure widely different from that of a natural tissue; none appear as infiltrations displacing or overwhelming the original tissues of their seat; none show a natural proneness to ulceration; nor is the ulceration, which may happen in one through injury or disease, prone to extend into the adjacent parts; none appear capable of multiplying or propagating themselves in distant parts; none grow at the same time in many different tissues.

For malignant tumours it is, I think, most probable that they are local manifestations of some morbid state of the blood; that in them are incorporated peculiar morbid materials, which have accumulated in the blood, and which their growth may tend to increase. All their distinctive characters are, I think, consistent with this view; and if the absence of the same characters in innocent tumours may lead us to believe that they are completely local diseases, then we can, perhaps, only speak of them as the result of some inexplicable error of nutrition in the part that they affect, and as being only in the same measure dependent on the state of the blood as are the natural tissues, which require, and may be favoured by, the presence of their appropriate materials of nutrition.

It may be best to speculate no further, either on this point, or on the origin or determining causes of tumours. I could speak certainly of very little connected with these points, unless it were of the error or insufficiency of all the hypotheses concerning them that I have proposed to myself, or have read in the works of others.

Division of tumours generally innocent, into cysts and solid tumours; and of cysts, into simple or barren, and compound or proliferous: subordinate groups of each. Division of solid innnocent tumours into fatty, fibro-cellular, fibrous, fibroid or fibro-plastic, cartilaginous, osseous, glandular, and vascular or erectile: subordinate groups of each. General distinctions of tumours and outgrowths.—Narrowing, now, the objects of consideration to the innocent tumours alone, I will speak very briefly of their classification.

A first sub-division of them may be made, according to the usual arrangement, into the cysts or cystic tumours, and the solid tumours. There are, indeed, not a few instances in which the two divisions overlap or are confused. Thus, on the one side, in cases to which I have already referred, a solid growth may spring from the inner walls of a cyst, and enlarging more rapidly than the walls do, may fill the cavity, and come in contact and unite with the walls; and thus may be traced a complete series of gradations from the cystic to the solid tumour. On the other hand, cysts may be formed within solid tumours, and, increasing more rapidly than the solid structure, may reduce it to scarcely more than a congeries of cysts, or to one great cyst. Such changes are illustrated sometimes in fibrous tumours of the uterus; and, I think, also, in the tumours, which Sir Astley Cooper called "hydatid disease," of the testicle.

But though there are these instances of confusion, yet the division is very convenient, and is probably deeply and well founded.

Next, among cysts, some are filled with a simple fluid, containing no organized matter, and resembling one or other of the fluids of serous cavities. These may be called simple or barren, or, in most instances, serous cysts.

Other cysts contain organised substances, and may be named, as a group, proliferous; and the several members of the group may be described, according to their contents, as glandular, cutaneous, sebaceous, epithelial, dental, and the like.

Of the solid innocent tumours, no method of arrangement at present appears reasonable but the old one, which is founded on their likeness to the natural tissues. On this ground they may be arranged in eight divisions, with names, as specific names, expressing their several resemblances, —viz., fatty, fibro-cellular, fibrous, fibroid or fibro-plastic, cartilaginous, osseous, glandular, and vascular or erectile. And, again, under each of these may be arranged certain varieties, including instances that, in some uniform manner, deviate, without quite departing, from the usual characters; as the fibro-cystic, fibro-calcareous, and other varieties of the fibrous tumours.

In each assumed species or group of these solid tumours, moreover, we must make a division, according to their modes of growth, and of connection with the adjacent parts. Some among them are only intermediately connected with the adjacent parts; a layer of tissue at once separates and combines them, and, by division of this layer, such a tumour may be cleanly and alone removed from the surrounding parts: it may be enucleated or shelled-out from them. Thus, with a common fatty tumour, or a fibrous tumour of the uterus, if we cut along one part of its surface, we may, with a blunt instrument, detach the whole mass, by splitting

the layer of fibro-cellular tissue which, like a capsule, incloses and isolates it.

These are what we commonly accept as the proper or typical tumours, these which are "discontinuous hypertrophies."

Other growths resemble these in every character, except in that they are connected with the adjacent parts by continuity of similar tissue, and thus appear as growths, not in, but of, the parts. Thus we cannot exactly isolate a polypus of the nose or of the uterus: the overgrown part cannot be enucleated, because the proper tissue of the nasal mucous membrane, or of the uterine wall, is continued into it; the tissue of the growth is here not only uniform, but continuous, with that of the adjacent parts. So, too, with epulis: the gum itself, or the periosteum of the jaw together with the gum, seems, by its own excessive growth, to form the tumour; and in other fibrous tumours on bones, the fibres of the periosteum appear to be in the growth, and to form part of it.

Such growths as these might be named "continuous hypertrophies," or "outgrowths;" and I will, in general, observe this distinction wherever the same tissue is, in different cases, found in both forms of growth; calling the discontinuous masses, tumours,—the continuous ones, outgrowths. Thus, answering to the common fatty tumour, we find the pendulous and continuous fatty outgrowths of the neck or the abdominal walls; answering to the fibro-cellular tumour that grows, as a discontinuous mass, in the scrotum or beneath the labia, we have the cutaneous outgrowths or enlargements of these parts; to the fibrous tumours of the uterus answer the fibrous polypi or continuous outgrowths of its substance. All these instances of clear distinction might lead us to think that a strong definition-line might be drawn to divide the whole class of innocent overgrowths into tumours and outgrowths. But when we come to the tumours of bone and periosteum, and to the erectile tumours, we find the distinctions vanishing, and in many instances no longer possible—*Medical Gazette, May* 30, 1851, *p.* 925.

[Next comes the consideration of cysts or cystic tumours.]

Simple or barren cysts—Their general characters and varieties—Modes of origin: (a) *by expansion or enlargement of natural spaces or areolæ:* (b) *by dilatation of sacculi or parts of ducts:* (c) *by development and growth of new-formed nuclei or cells. Illustrations of the third mode of origin; in cysts in the kidney. Probable deduction concerning the origin of solid tumours.*—We may conveniently arrange cysts under the titles "simple" or "barren," and "compound" or "proliferous"; the former containing fluid or unorganised matter, the latter containing variously organised bodies.

Among the simple or barren cysts, of which I speak to-day, we find some that contain a fluid like that of one of the serous membranes; such are certain mammary cysts, and those of the choroid plexus: some are full of synovial-like fluid, as the enlarged bursæ: others are full of blood, or of colloid, or some peculiar abnormal fluid: while others, forming the transition between the barren and the proliferous cysts, contain more highly organic secretions, such as milk or mucus, or salivary or seminal fluid. These several forms we may arrange with names

appropriate to their contents; as serous, synovial, mucous, sanguineous, colloid, salivary, seminal, and others.

Among the cysts, whether barren or proliferous, it is probable that at least three modes of origin may obtain. 1st. Some are formed by the enlargement and fusion of the spaces or areolæ in fibro-cellular or areolar or other tissues. In these spaces fluids collect and accumulate; the tissue becomes rarefied; and, gradually, the boundaries of the spaces are levelled down and walled-in, till a perfect sac or cyst is formed, the walls of which continue to secrete. Thus are produced the bursæ over the patella, and others; and to this we may refer, at least in some cases, the formation of cysts in tumours, and, perhaps, in other parts.

2ndly. Some cysts are formed by dilatation and growth of natural ducts or sacculi; as are those sebaceous or epidermal cysts which, formed by enlarged hair-follicles, have permanent openings. Such, also, are certain cysts containing milk, that are formed of enlarged portions of lactiferous tubes; such are the ovarian cysts formed by distended and overgrown Graafian vesicles; and such appear to be certain cysts formed of dilated portions of blood-vessels shut off from the main streams.

3dly. Many—and perhaps the great majority of cysts, such as those of the kidney, the choroid plexuses, the chorion, and the thyroid gland —are formed by the enormous growth of new-formed elementary structures having the characters of cells or nuclei, which pursue a morbid course from their origin, or from a very early period of their development.

It might, on some grounds, be desirable to classify the cysts according to their respective modes of formation; separating the "secondary cysts," as those have been called which are derived by growth or expansion of normal parts, from the "primary," or as they might be called the "autogenous" cysts. But at present, I believe, such a division cannot be made; for of some cysts it is impossible to say in which method they originate, and, in some instances, either method may lead to an apparrently similar result. Thus. some sebaceous or epidermal cysts are clearly formed of overgrown hair-follicles; others are of distinct autogenous origin. Some ranulæ are probably formed by dilatation of the submaxillary duct, obstructed by calculi or otherwise; others by anormal development of distinct cysts, or possibly of a bursa between the muscles of the tongue. Some cysts in the mammary gland are certainly dilated portions of ducts; others are, from their origin, anormal transformations of the elementary structures of the gland. But, in each of these cases, it may be impossible, when the cyst is fully formed, to decide what was its mode of origin—whether by growth of parts once normally formed, or by transformation of elementary and rudimental structures.

Of the three modes of formation of cysts to which I have referred, the first two, namely, that which is accomplished by expansion of areolar spaces, and that by dilatation and growth of ducts or vesicles, scarcely need an explanation.

But for the third method of formation a more detailed account is required; and this I will now endeavour to give.

The general structures of the cysts thus formed may be best studied in those that are so commonly found in the kidneys, or the mammary or

thyroid gland, or in any instance of an ordinary serous cyst. Such a cyst, when large enough for naked-eye examination, is usually constructed of fine, well-formed fibro-cellular tissue, of which the filaments are commonly mingled with nuclei, or nucleus-fibres, and are variously interwoven in a single, or in many separate layers. The membranous walls thus formed are, in general, rather firmly connected with the adjacent parts, so that the cyst cannot easily be removed entire; and from these parts they derive the blood vessels that usually ramify copiously upon them. They are usually, also, lined with epithelium, which, so far as I know, is always of the tesselated form, and may consist, according to Rokitansky, of either nuclei or nucleated cells.

I am not aware that minute examinations have been made of the modes of earliest formation of any of the cysts of this kind, that are common subjects of surgical consideration; but there can be little doubt that, in their formation, they resemble the cysts of the kidney and other internal organs. In these organs the origin and progress of cysts have been profoundly studied by Rokitansky; and I shall best describe them by giving an abstract of some of the observations which he has recently published. They confirm and greatly extend the results obtained by the similar investigations of Frerichs, and they fully establish the accuracy of the observations on the cystic degeneration of the kidney which were made by Mr. Simon, to whom pathology is indebted for the first sure step in this rich path of inquiry. They may be repeated in almost any portion of a granular kidney containing cysts, or in a choroid plexus with cysts; but, I believe, the process may be best traced in the cystic disease of the embryonic chorion—the hydatid mole, as it has been called.

In a portion of such a granular and cystic kidney, nests, as Rokitansky calls them, of delicate vesicles, from a size just visible to that of a millet-seed, may be seen imbedded in a reddish grey or whitish substance. These differ in size alone from the larger cysts to which one's attention would be sooner attracted; and, on the other side, it is simply in size that they differ from many much smaller. For if a portion of such a nest be examined with the microscope, one finds, together with the debris of the kidney, variously diseased it may be, a vast number of vesicles or cysts that were invisible to the naked eye. The most striking of these have a wall consisting of layers of fibres scattered over with curved nuclei, and are filled with granulated nuclei, or more rarely, with round or polyhedral cells, some of which may contain a molecular or granular pigmental matter. In many of these cysts, the nuclei or cells are reduced to an epithelial lining of the cyst; and in some even this is absent, and the barren cyst is filled with a clear or opaline adhesive fluid.

From the size just visible to the naked eye, such cysts vary down to 1-500 of an inch in diameter; and, together with these, are cysts whose walls (though their contents are like those of the others) consist of a structureless hyaline membrane: and these lie in a stroma which is equally simple, but seems to develop itself gradually into a fibrous structure circumscribing the cysts.

Moreover, one finds, in the same specimens, structures of the most various sizes, which, except in size, agree completely with the last mentioned structureless vesicles, and show every grade of size down to that which is

just larger than a nucleus. The smallest of these contain a clear fluid, or are slightly granulated: in the larger there is a central nucleus, and to this are added a second, a third, and a fourth nucleus, and so on till there appear several which fill up the commensurately enlarged vesicle. Now in such a nucleus seems to lie the nucleus of the history of development of these autogenous cysts, not in the kidney alone, but in any part in which they may occur. A nucleus grows to be a cyst, whether a simple or barren one, or one that has an endogenous production of nuclei, or cells, or any other structures. And perhaps, in the same specimen, the earlier history of the nucleus itself may be traced; for one sees, together with the nuclei, still smaller corpuscles of all sizes, down to that of the elementary granule, so-called, and these, the larger they grow, the more are they like nuclei; so that, perhaps, the progress of the disease is from these granules, enlarging to the formation of nuclei, and thence pursuing some abnormal course.

It would be tedious now to trace, from this general sketch of their origin, all the phases through which such cysts may pass. Rokitansky has done it amply. We have here the elementary constituents. But the simple cyst-wall is capable, not only of growing, but of acquiring, by appropriation and development of surrounding blastema, the laminar and nucleated fibrous tissue, which we find in its full estate; acquiring these we may presume just as, more normally, the simple membranous wall of a new blood-vessel acquires, as it grows, the nuclei and fibrous tissue that belong to its more perfect state. Such might be the least abnormal course of any cyst: but from this it may deviate; thickening, acquiring continually new layers, calcifying, and in other ways showing the signs of degeneration or disease. The contents also of the cyst may assume even yet more various forms: to name only the extremes—they may retain the simple state of liquid; or with liquid there may be a simple, or a specially secreting, epithelial layer; or the contents may acquire the structure of well-organised glands, or cancer, or some other tissue, and between these extremes, according to conditions which we have no power to trace or explain, they may pass in any of the manifold ways of wrong, the ends of which I shall have to describe.

Important as the history of cysts may be in its direct bearings, yet these are not all that we may observe in it. In their history I cannot but think we may discern an image of the first form and early progress of many innocent solid tumours also. For, as the cyst is traced from the mere nucleus, or even from the granule, onwards to its extreme size or complexity of structure or contents, so, it is very probable, from the numerous correspondences between them, that these solid tumours also have a similar beginning in some detached element, or tissue-germ, or in some group of such germs, which in their development and growth, may coalesce, and then may appropriate, or exclude for absorption, the intervening substance.

Thus, in the form of erring nuclei, we may, I think, almost apprehend the structural origin of these cysts and tumours: yet, if we may, the the question still remains whether the elementary structures in which they begin be some new and special morbid elements, or some natural rudimental structures perverted from their normal course. Rokitansky,

in his explanation of the cyst-formation, implies that the cyst is derived from a new element. Mr. Simon, speaking of the cysts of the kidney, regards them as "vesicular transformations of the ultimate structure of the gland"; and to this view, without adopting some ingenious suppositions which he has connected with it, I would adhere. For, unless a cyst or a solid tumour (assuming this mode of their origin to be correct) were really a transformation of a nucleus, or a cell, of the part in which it grows, we could not understand the very general similarity that we find, between the contents of certain cysts and the secretions or structures of the glands in or near which they occur; nor yet the likeness which commonly exists between the solid tumour and the tissue in which it is imbedded. These things are as if the first beginning of the abnormal growth were in some detached element of the natural tissue, which element, being perverted from its normal course, thenceforward multiplies and grows, conforming, in nearly all cases, with the type, in minute structure and composition, but more and more widely deviating from it in shape and size.

Such are the facts, and such the speculations that we may entertain respecting the origin, or, at least, the smallest visible beginning, of a cyst or an innocent solid tumour. Need I add that if even this be true, we are yet far from the explanation of the cardinal point in the pathology of tumours—their continual growing. Why should these detached tissue-germs, or any less minute and less isolated portion of an organ, grow while all other germs and parts that are most like them remain unchanged? I have already confessed my ignorance.

[The particular form of the simple or barren cysts are now illustrated. Of the first class of *gaseous cysts,* little need be said; these scarcely deserve notice.]

Varieties of barren cysts:—Gaseous: Serous: in the neck, breast, gums, &c.: Synovial: Mucous: Nabothian, Cowperian, &c.: Sanguineous: Oleaginous: Colloid: Seminal.—The *Serous Cysts* are, of all the order, the most abundant. Their most frequent seats are, by a hundredfold majority, in or near the secreting glands or membranes, or the so-called vascular glands; but there is scarcely a part in which they may not be found. Their frequency in connexion with secreting structures has led some to hold that they are all examples of perverted epithelial or gland-cells; but their occurrence in such parts as bones and nerves, among deep-seated muscles, and in fibrous tumours, makes it sure that they may originate independently of gland-cells; though why any element of a solid tissue should retain the vesicular form which it has in its germ-state, and in that form grow, we cannot tell.

Of this numerous group of serous cysts, however, I will speak at present of only such as may best illustrate their general pathology, and are of most importance in surgical practice; and I will, to these ends, refer chiefly to the cysts in the neck and in the mammary gland.

Single serous cysts in the neck form what have been called "hydroceles of the neck," and are well exemplified by a specimen in the museum. This is a single oval cyst, with thin, flaccid, membranous walls, and even now, after shrinking, measures more than six inches in its chief

diameter. It was successfully removed by Mr. Thomas Blizard from between the platysma and sterno-mastoid muscles; and a part of it is said to have passed behind the clavicle. It was filled with a clear brownish fluid.

Such cysts, but various in size and other characters, are more apt to occur in the neck than in any other part of the body.

Some of these cysts in the neck appear to be transformations of vascular tumours—*i. e.*, of erectile vascular growths or nævi. I shall refer to this point again: it is made probable by the close connection which some of these cysts have with large, deep-seated veins; by the occasional opening of blood-vessels into their cavities; and by their sometimes distinctly forming portions of vascular nævi. Thus, a child, three and a half years old, was under Mr. Lawrence's care two years ago, in St. Bartholomew's Hospital, with a tumour covering the greater part of the left side of the neck, and the lower part of the cheek. Such a swelling had existed from birth, but it had of late enlarged very much. It was composed of a cluster of close-set cysts, containing coagulable fluid; but at its upper part a firmer portion of its mass consisted of a collection of tortuous and dilated blood-vessels, like those of a nævus. The examination made of it, by Mr. Coote, after its removal, was such as to leave little doubt in his mind that it had origin in or with a nævus growth; and other cases, to which I shall refer in speaking of erectile tumours, have confirmed this view, especially some of those which are published by Mr. Hawkins.

But when we have separated all the serous cysts in the neck that may be referred to these two sources, there will probably still remain many that we can assign to no such mode of origin, and which at present we must class among primary or autogenous cysts, independent of any secreting structure.

Among these are some with fluid contents of peculiar viscidity—ropy, or honey-like, and deriving a peculiar aspect from including abundant crystals of cholestearine. Such contents may occur, perhaps, in any cyst in the neck or elsewhere; but they appear to be comparatively frequent at or near the front of the larynx. Here is such a cyst, attached to the hyoid bone of a sailor, between fifty and sixty years old, in whom it had existed nearly as long as he could remember. It contained a brownish-yellow, grumous, honey-like fluid, with abundant crystals of cholestearine.

Last year Mr. Lawrence had, at St. Bartholomew's Hospital, a patient, thirty-five years old, on the left side of whose neck, directly over and closely attached to the thyro-hyoid membrane, was a smooth oval tumour, about an inch in length. He had observed a regular increase of this tumour for five or six years; but its bulk and deformity alone were inconvenient. Mr. Lawrence freely cut into it, and let out a thick honey-like fluid, in which large groups of crystals of cholestearine were visible even with the naked eye. The cyst, after the incision, suppurated, and then the wound healed, and the patient left the hospital quite well.

I may add that such cysts as these are not uncommon near the gums, lying usually beneath the reflection of the mucous membrane from the gum to the cheek. Their occasional large size, and their thick walls ob-

securing the sense of fluctuation, may make them at first look formidable. A woman, thirty-eight years old, was under my care last September, in whom, at first sight, I could not but suppose something was distending the antrum, so closely was the deformity of the face due to such diseases imitated. But the swelling was soft and elastic, and projected the thin mucous membrane of the gum of the upper jaw, like a half-empty sac. I cut into the sac, and let out nearly an ounce of turbid brownish fluid, sparkling with crystals of cholestearine. The posterior wall of the cyst rested in a deep excavation on the surface of the alveolar border of the upper jaw,—an adaptation of shape attained, I suppose, as the result of the long-continued pressure of the cyst, which had existed six years.

At nearly the same time a young man was under my care with a similar swelling of larger size, which he ascribed to an injury of the gum or alveolar border of the upper jaw only six months previously. In neither of the cases could I find any disease of the maxillary bone; but I believe it sometimes exists in intimate connection with these cysts.

In no organ is the formation of cysts more important than in the mammary gland. Every variety of them may be found here: but I will speak at present of only the serous cysts.

Some of these cysts are dilated ducts, or portions of ducts grown into the cyst-form. During lactation, cysts thus derived may be filled with milk, and may attain an enormous size, so as to hold, for example, a pint or more of milk. In other cases they may contain the remains of milk, as fatty matter, epithelial scales, &c.; or they may be filled with transparent watery fluid, without coagulable matter; but much more commonly they contain serous fluid, pure, or variously tinged with blood or its altered colouring matter, or with various green, or brown, or nearly black fluid.

The complete proof of the origin of some of these cysts as dilated portions of ducts, is, that by pressure they may be emptied through the nipple, or that bristles may be passed into them from the orifices of tubes. But although these facts may be often observed, yet I agree with Mr. Birkett in thinking that the majority of cysts in the mammary gland are formed in the manner of the renal cysts, to which, indeed, they present many points of resemblance.

The most notable instances of mammary cysts are those in which the whole of the gland is found beset with them. This may occur while the proper substance of the gland appears quite healthy; but I think it is more commonly concurrent with a contracted and partially indurated state of the gland,—a state which, independent of the cysts, appears similar to cirrhosis of the liver; and has, I think, been named cirrhosis of the mammary gland. Its coincidence with cysts proves its nearer relation to that shrivelled and contracted state of the granular kidney with which the renal cysts are so commonly connected; or, perhaps, more nearly to the shrivelled, indurated state of the lung that may coincide with dilatation of the bronchi.

The cysts in these cases are usually of small size, thin-walled, full of yellow, brown, green, and variously deep-coloured fluids,—fluids that are usually turbid, various in tinge and density, but not usually much denser than serum. They do not lie in groups, but are scattered through,

it may be, the whole extent of the gland. Similar small cysts are sometimes found in connection with hard cancer of the breast; and in this case they have been called by Mr. Hunter and others "cancerous hydatids:" but their proper relation in such cases appears to be, not with the cancer, but with the coincidently shrivelled gland.

In this disease of the mammary gland there is no reason to believe a malignant nature, though the coincidence with cancer appears not rare. Yet the diagnosis between it and cancer is not always clear.

The single cysts of the mammary gland may become enormous. I know not what boundary may be set to their possible size; but I find one case in which nine pounds of limpid "serosity" were produced in three months, in the breast of a woman thirty years old. In this case the walls of the cyst were thin, and the fluid serous; and the fact illustrates a general rule, that the cysts which contain the simplest fluids, and which have the simplest walls, are apt to grow to the largest size: thickenings of cyst walls, and, much more, their calcification, are here, as elsewhere, signs of degeneracy, and of loss of productive power.

It would appear as if any cyst of the mammary gland might, after some time of existence in the barren state, become prolific, and bear on its inner surface growths of glandular or other tissue.

[As to the *Synovial Cysts*—under this head may be included all the abnormal bursæ, or, as they are called, ganglions. These seem to be merely enlargements, with various transformations, of the bursæ naturally existing; and of a similar character are the bursæ forming anew in parts subject to occasional pressure.]

Under the name of *Mucous Cysts* we may include all such as are formed in connection with simple mucous membranes, or with glandular structures which we call mucous, while we know no other or peculiar office served by their secretions.

There may be many cysts of this kind; but the best examples appear to be those that may be named *Nabothian* and *Cowperian* cysts. The former probably originate in cystic degeneration of the glands of the mucous membrane about the cervix uteri. Protruding, either alone, or with polypoid outgrowths of the mucous membrane, they are observed successively enlarging, then bursting and discharging their mucous contents, and then replaced by others following the same morbid course. Or, instead of clusters of such cysts, one alone of larger size and simpler structure may be found.

The Cowperian cysts appear to be connected with the Cowper's or Duvernoy's glands in the female. Whether arising from dilatation of the duct, or from cystic transformation of the elementary structures of the gland, cannot be yet stated; but in the exact position of the Cowper's gland, and projecting into the vagina nearer its orifice, a cyst is often found, of regular oval shape, thin walled, of uncertain size, but growing sometimes to the capacity of a pint. Commonly the contents of such a cyst are a colourless, pellucid, or opaline ropy fluid, like that found in the closed-up gall bladder. But from this they often vary. I have seen the contents of such cysts like the ink of the cuttle-fish, like the fluid of melanotic tumours, and like thick turbid coffee; or, to the sight,

they may exactly resemble fluid fæcal matter. Moreover, these cysts are very apt to inflame and suppurate. Many abscesses projecting into the vagina have in these their origin; and the treatment these abscesses receive by free incision, is, I believe, appropriate for the cysts under all conditions.

The Sanguineous Cysts, or cysts containing blood, are, probably, in many instances, very nearly related to the serous. Some may be explained by an accidental hemorrhage into the cavity of a serous cyst; an event corresponding with the transformation of a common hydrocele into an hæmatocele. The contents of some of these cysts are, indeed, just like those of on hæmatocele; with fluid, and coagulated, and variously decolorized blood. But some cysts appear, from their origin, to contain blood; and this blood, I think, always remains fluid till it is let out, while that which collects by hemorrhage into a serous cyst is generally partially or wholly coagulated. Some of these cysts with blood are found in the same positions and circumstances as the serous. Thus, in the neck, a series of cases of blood-cysts might be collected, exactly corresponding with the serous cysts in that part, and, like them, probably derived from various origins, some lying in the thyroid gland, some near it, some traceable to connection with vascular nævi, some of proper origin.

Cysts containing *oil* or fatty matter, without any more highly organized substance, are very rare. Many contain fatty matters mingled with serous, epithelial, and other substances; but in these the fatty constituent is probably the result of the degeneration of the other contents. Some, however, appear to contain fatty matter alone. Mr. Hunter preserved a specimen of what he marked as "oil from an adipose encysted tumour." It was taken, I believe, from a cyst that grew "between the bony orbit and the upper eyelid" of a young gentleman. When recent, it was described as "pure oil, perfectly clear and sweet, which burnt with a very clear light, and did not mix with aqueous fluids, and, when exposed to cold, became as solid as the human fat."

Lately Mr. Wormald removed a small cyst from a woman's breast, the contents of which appeared to be pure oily matter, that congealed into a substance like lard, and contained crystals of margarine, but no organized corpuscles.

Colloid Cysts are at present a very ill-defined group; the term "colloid" being used by Frerichs, and other recent German writers, for all those morbid materials that are pellucid, jelly-like, flickering, half-solid, or more or less closely resembling the material found in gelatiniform, alveolar, or colloid cancer. Such a material is common in the cysts of bronchoceles, and in those of the kidneys, especially, I think, in those which are not associated with contraction of the renal substance, and which Baillie, and other writers of his time, described as hydated disease of the kidney.

The contents of these cysts may present the most diverse conditions; may be of all densities, from that of dilute serum to that of a firm jelly; may range between pellucidity and the thickest turbidness; may be of all hues of yellow, olive-green, orange, brown, pink, and nearly black. The thick and pellucid contents of such renal cysts are enumerated as

examples of colloid matter—so are the contents of ranulæ, and of many bursæ; but the type is the material of the so-called colloid cancer. This, however, is beyond the range of the present course of lectures; and I shall pass by it, referring to the already cited works of Frerichs and Rokitansky, and to that of Bruch, for the best information yet supplied.

The last group of cysts of which I shall now speak includes such as contain secreted fluids, like those of the glands, by the dilated ducts or transformed elements of which they are formed. Such are the cysts in the breast that contain milk, and probably many instances of ranula. The origin of the former is, probably, in dilatation of lactiferous ducts; that of the latter is uncertain. But the examples of this group, of which I wish more particularly to speak, are the seminal cysts, including under this name those that are usually called encysted hydroceles, or hydroceles of the spermatic cord. Their various forms are fully described by Mr. Curling, and are well illustrated by specimens in the Museum of the College. They are usually thin-walled spherical or oval cysts, imbedded in, and loosely connected with, the tissue of the cord. Their most frequent seat is just above the epididymis, but they may be found in any part of the spermatic cord. Their walls are formed of fibro-cellular tissue, and may be lined with delicate tesselated epithelium. Their contents are usually a colourless slightly opaline fluid, like water with which a little fluid has been mingled.—*Medical Gazette, June* 6, 1851, *p.* 988.

[Having traced and illustrated the formation of simple and barren cysts—the highest of which seem to be those which secrete a seminal fluid, and those which are lined by a complete secreting epithelium—Mr. Paget now proposes to describe the cysts which produce more highly organized, and even vascular, structures; or, as they may be termed generally, *proliferous cysts.*]

Compound or proliferous cysts—Distinction from clustered cysts—Modes of origin. 1. *Cysts, having cysts developed in or upon their walls; exemplified in the proliferous ovarian cysts, and the cystic disease of the chorion.* 2. *Cysts, having glandular or other vascular growths springing from their walls; as exemplified in the "serocystic sarcomata" of the breast, the lip, and other parts.* 3. *Cysts, with cancerous growths from their walls.* 4. *Cutaneous cysts, in the ovary, brow, &c.*—Of the first formation of cysts that may be proliferous I need not speak; for, as far as is at present known, they may be formed exactly as the barren cysts are. A cyst may be proliferous in whichever of the plans described in the last lecture it may have had its origin. Thus, 1, bursæ, formed by expansion and rarefying of areolar spaces, may be found with organized, pendulous, or loose growths from their walls. 2. Among the cysts formed by growth of natural cavities or obstructed ducts, we have instances of surpassing proliferous power in the ovarian cysts from Graafian vesicles, and of less power in some cases of dilated lactiferous tubes and dilated veins. And 3. Among the autogenous cysts we find, in the breast and other glands, some of the principal examples from which the following history of proliferous cysts will be derived.

The account given in the last lecture of the modes of origin of barren

cysts may therefore, so far as the cyst is concerned, suffice for the proliferous; and I shall now need to speak of only the intra-cystic productions, the differences of which may decide the grouping of the whole division of proliferous cysts.

1. The first group includes the cysts which have others growing in or upon their walls. Of these, two chief examples are presented, in the complex ovarian cysts, and in the cystic disease of the chorion or "hydatid mole."

The principal varieties of the complex ovarian cysts have been described to the very life by Dr. Hodgkin, to whom we are indebted for the first knowledge of their true pathology. But, since his minute description of them is or should be well known, I will more briefly say that, according to his arrangement, we may find in these proliferous ovarian cysts two principal or extreme forms of endogenous cysts; namely, those that are broad-based and spheroidal, imitating more or less the characters of the parent cyst, and those that are slender, pedunculated, clustered, and thin-walled. Between these forms, indeed, many transitional and many mixed forms may be found; yet it is convenient to distinguish the two extremes.

The general characters of this disease constituting the hydatid mole, are well known. A part, or even the whole, of the chorion is covered with pellucid vesicle, with limpid contents, borne on long, slender, and often branching pedicles. The cysts are usually oval or pyriform; their walls are clear, or have minute opaque dots; they may either be simple or may bear others projecting from their walls.

Dr. Mettenheimer has found that the minute dots besetting these cysts are villous processes, exactly resembling those of the natural chorion, and growing from the walls of the cysts, either outwardly or into their cavities. In these villi he traced the development of cysts. In their natural state, they may be described as filiform or clavate processes, often branching and bearing bud-like projections, and composed of dimly-granular substance, in which are imbedded minute nucleated cells. In this cystic disease, vesicular bodies may be seen scattered among the cells in the villi, which bodies are distinguished from the cells by their pellucidity, their larger size, and double contours; but, from the cells to these, every gradation may be so traced as to leave scarcely a doubt that the vesicles are derived from cells deviating from their normal characters. Thus in some of the cells the contents are seen lighter and less granular; in some they have entirely disappeared, without increase of size; and then, when their contents are thus become uniformly pellucid, and they have acquired the character of vesicles, the cells appear to grow, while their walls become stronger, and they acquire such a size that they are recognised as very small cysts, similar, in all but their size, to those which are visible to the naked eye.

Now, though this formation of cysts has been traced by Mettenheimer only in the villi which grow on the cysts themselves, and therefore, so to speak, only in the production of the cysts of the second and later generations, yet there can be little doubt that the first cysts in the diseased chorion are formed in its own villi after the same manner. For the villi borne on the cysts are, in all essential characters, like those natural to

the chorion; and the cysts of all generations are equally like. The whole process may, therefore, be probably thus described:—Certain of the cells in the proper villi of the chorion, deviating from their cell-form, and increasing disproportionately in size, form cysts, which remain connected by the gradually elongated and hypertrophied tissue of the villi. "On the outer surface of the new-formed cysts, each of which would, as it were, repeat the chorion and surpass its powers, a new vegetation of villi sprouts out, of the same structure as the proper villi of the chorion. In these begins again a similar development of cysts; and so on, *ad infinitum*." Each cyst, as it enlarges, seems to lead to the wasting of the cells around it; and then, moving away from the villus in which it was formed, it draws out the base of the villus, which strengthens itself, and forms the pedicle on which the cyst remains suspended.

Such is the account of the minute structure and formation of the cystic disease of the chorion: and perhaps no instance could afford a better confirmation of the production of cysts by the enormous growth of elementary cells, or a better type of the capacity of cysts thus formed to produce structures resembling those in the abnormities of which themselves originated. A similar capacity is among the characters of all the cysts of which I shall next have to speak.

2. I pass now to the consideration of the cysts that are proliferous with vascular growths from their internal surfaces.

The first group of them may include those that bear glandular growths —the "glandular proliferous cysts," as we may call them, because the minute structure of the substance growing into them is, in its perfect state, exactly comparable with that of a secreting or vascular gland.

Such cysts form part of the group to which the name of "sero-cystic sarcoma" was given by Sir B. C. Brodie, who first clearly distinguished them. They are also part of those which furnished to Dr. Hodgkin the chief grounds for his well-known theory of the formation of solid tumours—a theory which, in regard to at least these growths, has good foundation.

The chief seats of the formation of glandular proliferous cysts are the mammary and thyroid glands. Their history in the thyroid, in which their formation scarcely passes the bounds of health, is amply illustrated in the often cited works of Frerichs and Rokitansky, to which, as well as to the paper by Mr. Simon on the natural structure of the gland, I must, for brevity's sake, refer.

Now, from some part of the inner surface of a cyst, a vascular growth may spring; and, gradually increasing at a rate beyond that of the increase of the cyst, it fills more and more of the cavity. At length, the growth wholly excludes the fluid contents of the cyst, and its surfaces come in contact with the remainder of the cyst-walls. The growth may now coalesce with the walls of the cyst, and form one solid tumour, enclosed in and connected with them, just as ordinary solid tumours are invested and connected with their fibro-cellular capsules. Or, growing yet further and more rapidly, the growth, hitherto intra-cystic, may protrude through its cyst-walls and the superjacent integuments,—protruding through them like a hernia of the brain, growing exuberantly over the adjacent skin, and, like such a hernia, reproduced when cut away.

The time in which these changes may be accomplished is extremely various. Usually, the increase of the intra-cystic growth appears to be painless, and it may be very slow: ten years or more may pass with little change; but the increase is generally faster, and it often shows an accelerating rate; so that, late in the disease, the progress is extremely quick, even quicker than that of most cancerous growths.

3. I have said we may not justly regard these recurring cystic growths as examples of malignant disease; yet the fact had better be here inserted, that their mode of growth may be imitated by genuine cancerous diseases.

Cancerous growths may be found in cysts under at least two different circumstances,—namely, in cysts that of themselves appear innocent, and in cysts produced within cancers.

Of the former mode of growth we have examples sometimes in ovarian cysts. Well-marked cancerous growths, usually of the medullary or the alveolar form, may grow from their walls; and herein is the best—perhaps the only unexceptionable—instance of the transformation of an innocent into a malignant tumour.

The second mode of production of intra-cystic cancers is best shown in some examples of medullary tumours of the testicle. In these we may see a repetition, so far as the outline plan is concerned, of the intra-cystic production of thyroid gland. The great mass of the medullary disease includes smaller masses, completely incapsuled with fibro-cellular tissue, and commonly presenting a lobed and laminated form, at once reminding us of the intra-cystic mammary glandular growths, and justifying the application to them of the principles of Dr. Hodgkin's theory of the growth of cancers.

In these medullary testicles the intra-cystic medullary growths have usually filled the cysts and coalesced with their walls. In rare cases one can discern how the growths spring up as spheroidal, or as pedunculated, branching, and grouped, processes from the interior of the cysts. This condition is peculiarly well shown in a case of cancer of the clitoris, in which the whole of that organ is occupied or concealed by a cancerous mass inclosing several distinctly walled cysts, which are half filled with small, soft, and lobed cancerous intra-cystic growths.

A further consideration of this matter would be out of place in lectures on innocent tumours.

4. I proceed to the consideration of the cutaneous proliferous cysts—i. e., of cysts on whose inner walls a tissue grows having more or less the structure and the productive properties of the skin.

Instances of these in a perfect state are rare. In the large majority of cases the cutaneous structure, if it were ever present, has degenerated or disappeared; and we recognise the relations and import of the cysts only through their containing epidermal and sebaceous materials, of which the production is a peculiar attribute of the tissues of the skin.

Among the parts in which these skin-bearing cysts may be found are some that have no natural connection with the skin. Thus (*a*) they are frequent in the ovaries: one or more Graafian vesicles enlarge and grow, and then, apparently produce on their inner surface a growth of skin, with its layer of cutis, subcutaneous fat, epidermis, and all the minute

appended organs of the proper integument of the body: or (*b*) such cysts may form in the subcutaneous tissue. They are, indeed, rare in this tissue in man, except in cases of congenital growth; but in the little cysts that are found at or soon after birth, about the brow, or in or near the orbit, the inner surface is often perfectly cutaneous; and Lebert has detected in such cysts all the minute structures and organs of the skin. Some similar specimens of cysts lined with skin are in the Museum of the College. These were taken from the subcutaneous tissue of a cow and of an ox; and in some of them the inner surface of the cyst could hardly be distinguished from the outer hairy integument of the animal.—*Med. Gazette, June* 20, 1851, *p.* 1057.

Fatty Tumours—Their capsules, or investing tissues, as an example of those generally connected with innocent tumours—Causes.—Among the solid tumours, the first that may be considered is the fatty or adipose tumour,—the lipoma of some, the steatoma of others; the most simple in its texture; the most like the natural parts; the least liable to variations;—a morbid growth so well known, that I can scarcely hope to impart any interest to an account of it.

Fatty tumours are, I believe, always invested with a capsule or covering of fibro-cellular tissue: and of these capsules, since they exist with most of the innocent tumours, I may speak now once for all. The capsule, then, of such a tumour is usually a layer of fibro-cellular tissue, well organised, dry, and containing blood-vessels proportioned to the size of the tumour. It appears to be formed of the fibro-cellular tissue of the part in which the tumour grows, increased and often strengthened in adaptation to the bulk and other circumstances of its contents. It grows with the tumour, invests it, and at once connects it with the adjacent tissues, and separates it from them,—as *e. g.*, similar fibro-cellular tissue does each muscle in a limb. Its adhesion to both the tumour and the parts around it is more intimate than that of its layers to one another; so that when such tumours are cut into, they may be dislodged by splitting the layers of their capsule, and leaving some of it on the tumour, and some in the cavity from which the tumour is extracted. This, at least, can be done easily unless the tumour has been the seat of inflammation, which may thicken the capsule and make all its parts adherent to one another, and to the tissues on either side of it.

In the capsule, the blood-vessels that supply the tumour usually first ramify. One principal artery, indeed, commonly passes straightway into the tumour at its deepest part, but the rest branch in the capsule, especially in any thicker parts of it that lie in the spaces between projecting lobes of the tumour. Hence, with the partitions of the tumour that are derived from the capsule, the blood-vessels pass into its substance.

Respecting the causes of these tumours, few things can be more obscure. Nearly all knowledge on this point is negative. The growth may have followed an injury, and we may call this the cause of its formation; but we can give no explanation why such an event as an injury, which usually produces only a transitory impairment of nutrition, or a trivial inflammation, should, in these cases, give rise to the production of a new and constantly-growing mass of fat.

Fibro-cellular tumours—Distinguished from corresponding outgrowths —Their general and minute structure.—[In considering the fibro-cellular tumours, Mr. Paget remarks upon the singularity of its rarity, especially as the tissue of which it is composed is so abundant; but for ten tumours formed of fat or cartilage we do not find more than one of fibro-cellular tissue.]

As in the last species, so in this, we find instances of both outgrowths and tumours,—*i. e.*, of both continuous and discontinuous overgrowths. The former are, indeed, abundant; for, among them, as being formed chiefly of overgrowing fibro-cellular tissue, we must enumerate, 1st. nearly all the softer kinds of polypi, such as the mucous or gelatinous polypi of the nose, and the polypi of the external auditory meatus; 2ndly. the various cutaneous outgrowths, such as occur in the scrotum, labia, nymphæ, clitoris, and more rarely in other parts; and, as hardly to be defined away from these, the warty and condylomatous growths of skin; and, 3rdly, the overgrowths of scars, the cheloid tumours as they are named; for in all these we find overgrowing tissue, resembling, for the most part, the fibro-cellular in a more or less developed state.

The form in which the fibro-cellular tumours are most frequently seen is that of oval or round masses of soft, elastic, close, and pliant tissue, smooth and uniform, or, when they grow among yielding parts, deeply and variously lobed. Their exterior surface is connected with the adjacent parts by a capsule of fibro-cellular tissue, which generally splits readily. When handled they feel peculiarly tense and elastic; their outer surface may shine like a thin sac full of fluid. On their sections we see opaque white bands, intersecting a shining succulent basis substance, of serous-yellow or greenish yellow tint. Through this basis the bands course in circles or wavy lines, or form complete partitions, or, in the smaller lobes of the tumour, they run without order, only forming white marks on the yellow ground colour, but giving no appearance of grain, or of regularly fibrous structure.

The peculiar yellow colour of the basis-substance of these tumours, makes them look, at first, like fat; it is due, however, not to fat, but to a serous or synovia-like fluid, which is infiltrated through the substance of the tumour. The mass is just like anasarcous cellular tissue; most of all like the subcutaneous cellular tissue of the back, as one sees it dissected in a dropsical body. When such a tumour is cut through or sliced, the clear yellow fluid oozes from it, or may be abundantly pressed out, while the filamentous tissue contracting becomes denser and more compact, and more uniformly opaque white, like that of the softer varieties of fibrous tumour. It is to these last-named tumours, indeed, that the fibro-cellular have the nearest relations, and into them that they "pass" through gradational specimens; but there is just the same difference, as well as just the same relation, between these kinds of tumours, as there is between the natural fibro-cellular and fibrous tissues, and there is a similar propriety in distinguishing them.

Examined with the microscope, the fibro-cellular tumours display the filamentous tissue or appearance characteristic of that after which they are named. In many cases, or in many parts, parallel, soft, undulating filaments are found collected in fasciculi, which interlace, and from which

single filaments can often be traced out; or, where this is not seen, the texture looks filamentous, through markings or wrinkles of its surface. The best developed and most filamentous tissue is in the intersecting white bands: but similar tissue is present everywhere.

The homology of these tumours, in respect of tissue, is just as perfect as that of the fatty tumours. In chemical analysis they may yield gelatine from the well-formed fibro-cellular tissue; but I believe they yield much more albuminous matter from their imperfectly developed tissue, and from the serous fluid that is soaked in them.

In general, there is nearly complete uniformity through the whole mass of one of these tumours; oftentimes, however, different portions are more or less œdematous (if I may so call them); and, which is more remarkable, portions of cartilage, sometimes partially ossified, may be found in them. I have twice seen this. In the first case, nodules of cartilage were imbedded in a fibro-cellular tumour that grew in the ball of the great toe; and in the second, (a similar tumour from the thigh), a portion of its surface, and one of its chief partitions, were formed with cartilage partially ossified.

The most frequent seats of fibro-cellular tumours appear to be the scrotum, the labium, or the tissues by the side of the vagina, the deep-seated intermuscular spaces in the thigh, and the scalp. They may occur, probably, in many other parts; but either they particularly affect these, or else a singular chance has shown them to me in these situations almost alone.

Painful subcutaneous tumours—Their usual seats and structures—Their painfulness—Its supposed relation to nerves enclosing, or adjacent to, them—Differences between these tumours and the "neuromata"—Probable neuralgic nature of the pain.—Painful subcutaneous tumours form a group peculiar for the pain with which they are connected, and which is so remarkable as to justify giving a description of them separate from that of the fibro-cellular and fibrous tumours, with which, considering their other characters, they might be placed.

The painful subcutaneous tumour, or tubercle, has been often well described in relation to its general characters. Its intense painfulness was too striking to escape observation. It was described by A. Petit, Cheselden, Camper, and others; but the first, and to this time the best, general account of the disease, drawn from many instances, was given by Mr. William Wood in 1812. Dupuytren added many instances to those which he copied from Mr. Wood's paper, and made the disease much more widely known.

The especial seat of growth of these little tumours is, as their name implies, in the subcutaneous cellular and adipose tissue. They are most frequent in the extremities, especially the lower: very rarely they occur on the trunk, or the face. They are about four times more frequent in women than in men; they rarely, if ever, begin to form before adult life, or after the commencement of old age. It is seldom that local injury, or any other cause, can be assigned for their occurrence.

The tumour usually lies just beneath the skin, scarcely prominent; it has a capsule loosely connected with all the surrounding parts, unless it

be to the cutis, to which it may be tightly fixed, and which, in such cases, is generally thin, tense, polished, and like a superficial scar. Sometimes the small blood-vessels of the skin over and around the tumour are enlarged and tortuous, like those near a cutaneous nævus; but, else, all the adjacent parts appear healthy.

Tumours of this kind rarely exceed half an inch in diameter; they are usually spheroidal, oval, or cylindriform; they are firm, nearly hard, tense, and very elastic. Their outer surface is usually smooth, bright, yellowish, or greyish, or pure white; and their sections have the same aspect and consistence, or are varied by an obscure appearance of pure white fibres traversing a greyish basis.

The characteristic of all these tumours is their pain,—pain which may precede all notice of the tumour, or may not commence till much later, or may be contemporary with it, but which, when once it has set in, may rise to very agony, such as I suppose is not equalled by any other morbid growth. It is not often constant; but generally, without evident cause, or with only a slight touch of the tumour, a paroxysm of pain begins, and, gradually increasing, soon reaches a terrible severity. Beginning at or near the tumour, it gradually extends into all the adjacent parts, often flashing, like electric shocks, from one part of the limb to another, or to the whole trunk. Such a paroxysm may continue for a few minutes, or for several hours, and then it gradually subsides, leaving the parts sore and tender. While it lasts, the tumour, whatever may be its condition at other times, is always exquisitely sensitive; the muscles of the limb may act with irregular spasms, or general convulsions, like those of an epileptic seizure, may ensue. Sometimes, too, the tumour itself swells, the blood-vessels around it become larger and more tortuous, and the skin becomes œdematous or congested, imitating the change which sometimes ensues in a neuralgic part. There are many diversities in the characters and modes of the pain; but this belongs to all the instances of it,—that its intensity is altogether disproportionate to its apparent cause, and that it cannot be explained by anything that can be seen in the structure or relations of the tumour.

This pain suggests interesting questions in relation to the pathology of all tumours; but, before considering it, let me add some facts to complete the history of these. They appear usually to be of very slow growth. I removed one from the leg of an elderly woman, who had noticed a gradual increase of it for ten years; yet, at last, it was less than half an inch in diameter. In other cases they may more quickly attain the same size; but this seems the limit of their size; and for any number of years, they may remain sources of intense pain, and yet undergo no apparent change of size or structure. They are usually single. I have found only one case in which more than one existed: in this case three lay close together over the great gluteal muscle. When excised, they are not apt to recur. I removed one from the back of the leg of a lady twenty-eight years old, from whom, two years previously, a similar growth was excised from the same part. After the first operation the pain was scarcely changed; after the second it ceased, and never returned. Sir Astley Cooper removed two painful tumours, at an inter-

val of a year, from a young lady's leg; but these are the only instances of apparent recurrence that I have found. I believe that they have no tendency to ulcerate, or to assume any of the peculiar characters of malignant disease.

In considering, now, the painfulness of these tumours, the first question is their relation to nerves: are nerves involved in them? and do they, as Velpeau seems to hold, differ from neuromata—i. e., from the fibrous or fibro-cellular tumours within the sheaths of the nerves—only in their position? are they only tumours within the superficial or subcutaneous nerves?

The general opinion is against this supposition. Dupuytren says that he dissected several of these tumours with minute care, and never saw even the smallest nervous filaments adhering to their surface. I have sought them with as little success with the microscope. Of course, I may have overlooked nerve-fibres that really existed. It is very hard to prove a negative in such cases; and cases of genuine neuroma, i. e., of a fibrous tumour within the sheath of a nerve, do sometimes occur which exactly imitate the cases of painful subcutaneous tumour. Such a case was under Mr. Stanley's care last autumn. An elderly gentleman had for two years observed a small subcutaneous tumour over the lower part of the semi-membranosus muscle. It was easily moveable, and, till within the last three months, had not been inconvenient; but at this time it became the seat and source of pain exactly like that of a painful subcutaneous tumour. It was removed; and I was able to trace, with the microscope, an exceedingly slender nerve, the filaments of which were spread out over one part of the tumour. The tumour was within the neurilemma, and was uniformly firm, elastic, yellowish, and composed of well-formed fibrous tissue.

Many that have been called painful subcutaneous tumours may have been such neuromata as this was. Still, I am disposed to think that most of them are only so connected with nerves, as ordinary innocent tumours are, that receive a few nerve-fibres in their substance. For (1.) the connection of the nerves with even very small neuromata is not so difficult to demonstrate, but that it should have been found, if it had existed, in some of the many painful tumours that have been examined. (2.) The neuromata often occur in large numbers in the same patient; the painful subcutaneous tumour is nearly always single. (3.) The neuromata usually grow constantly, and seem to have no limit of size; even when subcutaneous, they commonly exceed the size of the painful tumours, which generally grow to a certain small size, and in it remain stationary. (4.) Neuromata are most frequent in the male, the painful subcutaneous tumours in the female, sex. An analysis of twenty-six cases of neuroma taken promiscuously showed that nineteen had occurred in men, and seven in women; while in twenty-eight cases of painful subcutaneous tumours twenty-three were in women, and five in men;—evidence which is almost conclusive for the different natures of the two diseases.

However, even if it could be proved that these painful tumours are within nerves, the question respecting the source of pain would not be fully answered. We cannot ascribe the pain to merely the altered mechanical condition of the nerve-fibres; for tumours that are evidently

within nerves are not always nor even usually, painful. It is remarkable, that in nearly all the cases in which large tumours have existed in the trunks of nerves, there has been little or no pain. The facts collected by Mr. Smith are clear on this point. Moreover, the subcutaneous tumours themselves often remain long painless, and then become, without any other apparent change, extremely painful; and there are instances of tumours exactly resembling them, except in that pain has never been felt in them. I removed such an one from a lady's forehead. It was about as large as a pea, had been two years growing in the subcutaneous tissue, and had never given pain except once, when it was severely struck. It had all the apparent characters of structure of the painful subcutaneous tumour. I repeat, therefore, that we cannot assign the pain in these cases entirely to an altered mechanical condition of nerve-fibres in or near the tumour. We must admit, though it be a vague expression, that the pain is of the nature of that morbid state of nerve-force which we call *neuralgic*.

Of the exact nature of this neuralgic state, indeed, we know nothing; but of its existence as a morbid state of nerve-force, or nervous action, we are aware in many cases, in which we can as yet trace no organic change, and in many more, in which the sensible organic change of the nerves is inadequate to the explanation of the pain felt through them. In both these sets of cases we assign the pain (speaking vaguely) to a functional rather than to an organic disorder of the nerves,—a disorder commencing in the nerves of the part which is the focus of the pain, but transmitted from them to others which, in the nervous centres, are connected with them.—*Med. Gazette, July* 4, 1851, *p.* 1.

Fibrous tumours—Distinction from corresponding outgrowths—Investments and structure—Microscopic characters—Formation of cysts, and deposit of lime-salts, constituting the "fibro-cystic" and "fibro-calcareous" tumours—Disintegration and other diseases.—[The term "fibrous" is, perhaps, the best to signify the natural likeness of tumours to the natural fibrous and tendinous tissues of the body. Where they are constructed of more than one elementary tissue such names may be used as "fibro-muscular," "fibro-elastic," &c. The most common examples of this kind are the fibrous tumours, or bodies of the uterus—"the hard fleshy tubercle of the uterus," as described by Dr. Baillie. The general characters of this species may be mentioned.]

First, the usual distinction must be drawn between the tumours and the outgrowths of the same structure. The uterus presents examples of both. The fibrous uterine polypi, more properly so called, are continuous outgrowths of and from the substance of the uterus; the mucous membrane, and the muscular and fibrous tissues of the uterus, growing, in variety of proportions, into its cavity and that of the vagina. The fibrous tumours, as distinguished from these, are discontinuous growths of similar tissue, in or near, not of, the substance of the uterus.

[These fibrous tumours have usually a fibro-cellular capsule in the uterine walls; sometimes so dry and loose, that when the tumour is cut it almost of itself escapes from its cavity or bed. In the same manner

are covered the fibrous tumours in the subcutaneous tissue and the nerves.]

As on the exterior, so in sections, these tumours present various degrees of lobular arrangement. Some are uniform and scarcely partitioned; while others are formed in distinct and easily separable pieces; and between these are numerous intermediate forms.

As a general rule, the vascularity of a fibrous tumour is in an inverse proportion to its singleness and toughness of construction; for the blood-vessels, as in the natural fibrous structures, are distributed chiefly or exclusively in the fibro-cellular tissue partitioning and investing the denser substance. The tumours thus present various degrees of vascularity. Some, when the vessels of the uterus are fully injected, appear still quite white; but some appear as highly coloured with the injection as the uterus itself.

In microscopic examination, one finds, among the fibrous tumours, certain varieties of composition which are not always, if at all, expressed in their more manifest characters. In all, I believe, a large portion of the mass consists of tissue resembling the tendinous or fibrous, more or less perfectly developed, and variously arranged.

To the varieties of the fibrous tumour already named, two must yet be added, depending on changes which we may regard as degenerations. One consists in the formation of cysts, the other in the deposit of calcareous and other salts in the substance of the tumour; suggesting, severally, the names of the "fibro-cystic," and the "fibro-calcareous" tumour.

The formation of cysts is not rare in fibrous tumours, especially in such as are more than usually loose-textured. It may be due to a local softening and liquefaction of part of the tumour, or to an accumulation of fluid in the interspaces of the intersecting bands; and this is the probable mode of formation of the roughly bounded cavities that may be found in uterine tumours. But, in other cases, and especially in those in which the cysts are of smaller size, and have smooth and polished internal surfaces, it is more probable that their production depends on a process of cyst formation, corresponding with that traced in the cystic disease of the breast and other organs. The whole subject, however, in relation to the origin of the cysts, needs further consideration; and I will speak only of the general appearance of the fibro-cystic tumours.

First, then, we find examples of fibrous tumours thickly beset with small well defined and lined cysts. This appears to be the nature of the "hydatid testis" described by Sir A. P. Cooper: at least, most of the specimens that I have seen of it make me think that this is, essentially, a fibrous tumour in the testicle, with more or less of cyst formation in the tumour. A similar condition may be found, but is rare, in fibrous tumours of the uterus. It may be found, also, I believe, in fibrous tumours in nerves and other parts.

In another set of cases, we find one large cyst existing alone, or far predominating over all the others, in a fibrous tumour. This is most frequent in the tumours in the nerves, and in the uterus. In the latter organ it has peculiar interest, because the cyst, if it attain a great size, may be mistaken, and treated for an ovarian cyst. Several such cases

have happened. The preparation from one is in the Museum of the College; the history of which sent by Sir Everard Home, is, that it is "A portion of an uterus, in which a very large encysted tumour had formed. The patient had been twice tapped, and the cyst emptied. The case was supposed to be ovarian dropsy during life." In another case, Mr. Cæsar Hawkins, suspecting ovarian disease, drew fifteen pints of fluid from a great cyst in a fibrous tumour of the uterus. The patient died a long time afterwards, and the specimen, which is in the Museum of St. George's Hospital, shows an enormous fibrous tumour in the side wall of the uterus, having one vast cavity, and in its solid part many small cysts.

With regard to the fibro-calcareous tumour, it is to be observed that two methods of calcification exist,—a peripheral, and an interstitial. In the former, which is the rarer, we may find an ordinary fibrous tumour coated with a thin, rough, nodulated layer of chalky or bone-like substance. In the latter method, a similar substance is deposited more abundantly throughout the tumour, and is usually so arranged, that, by maceration, one obtains a heavy hard mass, variously knotted, and branched like a lump of hard coral. Such a specimen is here: it was found in a grave-yard, and was sent to Mr. Hunter as an urinary calculus; and a good one it would have been, seeing it is about five inches long. On analysis it yielded 18·644 per cent. of animal matter, consisting of gelatine, with a small proportion of albumen; and its other chief constituents were found to be phosphate and carbonate of lime, the proportion of carbonate being greater than in human bone.

A similar, but larger, specimen is in the Museum of St. George's Hospital; and one yet larger in that of the Middlesex Hospital, which has been described, with a history full of interest, by the President.

Now, the change which ensues in these cases is not ossification; true bone, I believe, is not formed in the fibrous tumours of the uterus. The change is a calcareous degeneration, consisting in an amorphous deposit of salts of lime and other bases in the place of the fibrous tissue. But the process is important, as being the manifestation of a loss of formative power in the tumour. The calcified fibrous tumours probably never grow, and are as inactive as the calcified arteries of old age.

With these degenerations I may mention, (though it has probably more of the nature of a disease), a softening of fibrous tumours, in which, quickly, and apparently in connection with increased vascularity and congestion, they become œdematous, and then, as their tissue loosens, become very soft, or even diffluent, or else break up, and appear shreddy and flocculent. In this state the outer and less softened part of the tumour may burst, or they may suppurate or slough.

The most frequent seat of fibrous tumours is, beyond all comparison, in the uterus. Indeed, we may hold that the fibrous uterine tumours are the most frequent of all innocent tumours; Bayle's estimate being probably true, that they are to be found in 20 per cent. of the women who die after 35 years of age. But I shall not dwell on the fibrous tumours in the uterus, fully described as they are by Dr. Robert Lee, and other writers on uterine pathology. I will only say, that such tumours may occur near, as well as in, the uterus; but that, in respect of this

nearness, they are probably limited to those parts in which fibrous and smooth muscular tissue, like those of the uterus, extend; namely, to such parts as the utero-rectal and utero-vesical folds, and the broad ligaments.

Next to the uterus, the nerves are the most frequent seats of fibrous tumours. But of these, while I can refer to the splendid monograph by Dr. Smith, I will say only that, among the neuromata the fibrous tumours reach their climax of multiplicity, existing sometimes in every nerve of the body, and amounting to 1200 or more in the same person.

So, too, I will pass by the fibrous tumours of bones, referring for these to Mr. Stanley's Treatise on the Diseases of the Bones, and to Mr. Cæsar Hawkins's Lectures on their Tumours.

Instead of these instances of fibrous tumours, the histories of which have been so fully written, I will select for illustration some that are less generally studied, especially those that are found in the subcutaneous tissue, and deeply seated near the periosteum, or other fibrous and tendinous structures.

Particular illustrations of fibrous tumours growing on tendinous or fibrous tissues—In the subcutaneous tissue—In or upon periosteum and bone—In or about the jaws.—The fibrous tumours of the subcutaneous tissue, to which those of the submucous tissue closely correspond, pass, as I have already said, with insensible gradations into the fibro-cellular. Many may be found that might deserve either name; but it is not very rare to find specimens with all the distinctive features ascribed to the fibrous tumours of the uterus. These form firm, nearly hard, and tense, round or oval masses imbedded in the subcutaneous fat, raising and thinning the cutis. They may here attain an immense size, as in a case from the Museum of Mr. Liston. A tumour, weighing upwards of 12 pounds, is here shown, which was removed from the front of a man's neck, together with a portion of the integuments and platysma that covered it. It was fifteen years in progress, and has now an aspect such as, I think, belongs only to a fibrous tumour. Specimens, however, of this size are very rare; they are commonly removed while less than an inch in diameter.

In microscopic characters the subcutaneous fibrous tumours have the general properties of the species, but they commonly contain elastic tissue, and they are apt, I think, to be lowly developed, having only a fibrous appearance, or even seeming composed of an uniform blastema, with imbedded elongated nuclei, like the material for the formation of new tendons.

A peculiar and important character in these fibrous tumours is, that though they may be completely isolated in every other part, they often adhere closely to the lower surface of the cutis, and that, if in any degree irritated, they soon protrude through it, and form vascular masses,—'fungous growths' as they are called. When this happens they may bleed profusely, and in a manner which, I believe, is not imitated by any other innocent tumour. Nearly five years ago, a woman 52 years old, was under Mr. Stanley's care, with a tumour that projected through the integuments in the inner part of the thigh, its base being imbedded deep in the subcutaneous tissue, and its surface protruding raw and

ulcerated. The origin of this tumour was uncertain, but it had existed more than nine years; it had grown quickly, and had begun to protrude within two and a half years. From its ulcerated surface hemorrhage frequently ensued; and the patient stated that at one time two quarts of blood flowed from it. The tumour was excised, and large vessels that entered its base bled freely in the operation. It appeared to be a well marked specimen of a soft and lowly developed fibrous tumour.

A similar case was under my care in a woman twenty-seven years old. The tumour, of three years' growth, and protruding over the front of the tibia, was similarly ulcerated, and used often to bleed; sometimes it bled largely, and once as much as half a pint of blood flowed from it. This also on removal appeared to be a fibrous tumour.

I have here, through the kindness of Mr. Birkett, a specimen of a much more formidable example of the same fact. A woman, sixty years old, had a large pendulous tumour in the front wall of her abdomen, suspended just below the umbilicus, and reaching half way to her knees. Its surface had a very inflamed appearance, and the separation of a slough from its posterior part gave issue to such hemorrhage as proved nearly fatal.

The tumour is a large, heavy mass, which was attached to the sheath of the rectus. It is everywhere firm and tough, except where its substance appears broken by blood issuing from numerous large vessels that traverse it. Mr. Birkett, who examined it soon after the patient's death, found its texture certainly fibrous.

The fibrous tumours that occur in or near accumulated fibrous tissues are well exemplified, medically, by those of the dura mater, and, surgically, by those which may be found at the tarsus or metatarsus imbedded among the complicated ligaments and other deep-seated parts. Some well-marked specimens are in the Museum of the College. One, from the collection of Mr. Langstaff, is an oval tumour, six inches long, fixed to the periosteum of the tarsal bones and to the adjacent parts, and filling the sole of the foot from the os calcis to the basis of the first phalanges. It was removed, with the foot, from a nobleman, thirty-five years old, in whom it had been observed gradually increasing for thirty years. It has all the general aspects of the fibrous tumour, as typified in those of the uterus.

A very similar specimen is shown in a tumour growing over the whole length of the dorsal aspect of the metatarsus; and with these may be mentioned a tumour which has some historic interest, for it was removed from the Hon. William Wyndham, the associate and friend of Pitt, and Fox, and Burke,—"the model of the true English gentleman." When he was sixty years old, and an invalid, he exerted himself very actively one night in saving from fire the library of a friend. During his exertions he fell and struck his hip; and from that injury the tumour appeared to derive its origin. It grew quickly, and in ten months it seemed necessary to remove it. Mr. Wyndham submitted to the operation, his biographer says, "with neither hope nor fear;" and it would be difficult to describe so briefly a more unfavourable state of mind. The operation was performed by Mr. Lynn. The tumour was attached to capsule of the hip, and was with difficulty removed. At first all went

well; but then, it is said, symptomatic fever came on, and death occurred on the 16th day. The tumour was, by Mr. Wyndham's request, placed in the Museum of this College; and I have had it sketched because it might be signalized as one of the most characteristic examples of this species.

I might add several to these cases, but these may suffice for illustrations of the fibrous tumours connected with the deep-seated fibrous tissues. All the specimens that I have seen have presented the strong white bands intersecting a greyish or dull white basis-substance, the characteristic firmness, heaviness, and tension; all, in microscopic examination, have shown the tough fibrous structure or appearance; all have yielded gelatine in boiling.

The fibrous tumours in the subcutaneous and deeper tissues are isolated, discontinuous growths, circumscribed by fibro-cellular tissue. In this they differ from most of those in the group of which I shall next speak—namely, the fibrous tumours connected with periosteum and bone; for these accord with the characters of outgrowths rather than of tumours, in that they involve the substance of the periosteum, including it, and investing or covering the bone.

The favourite seats of the fibrous tumours of bone and periosteum are about the jaws; on other bones they are very rare. The College-Museum is, I suppose, pre-eminently rich in fibrous tumours connected with the jaws, containing as it does the chief of those that were removed by Mr. Liston,—a series illustrative at once of his admirable dexterity, and of his sound knowledge on pathology.

These tumours of the jaws may, to both touch and sight, present the ordinary characters of the fibrous tumours, as already described. They usually approach the round or oval shape, but are generally knobbed, or superficially lobed, or botryoidal as some have called them. They are firm, dense, and heavy. On section, however, the majority of them, I think, are more uniform than the fibrous tumours of other parts. They are generally almost uniformly white, and scarcely intersected by any fibrous bands, except such as may divide them into lobes. Many of them also present, in their interior, minute spicula of compact, white, bony texture.

Among tumours so diverse in their seats and relations as the fibrous tumours, there are perhaps few things relating to their life that can be stated as generally true.

In the uterus many may exist at the same time: the whole wall of an uterus may be crammed with them, while others project from it into the peritoneal cavity. As Walter and others have observed, when a fibrous tumour fills the cavity of the uterus, or projects from it into the vagina, it is not usual for another to be found in the walls. Such cases do indeed occur, but they are comparatively rare. It is yet much more rare for fibrous tumours to be found in any other part at the same time as in the uterus. I find but one such case recorded; a case by Dr. Sutherland, in which, with several fibrous tumours in the uterus, one was found in the groin of a lunatic forty-two years old. But such a case is a most rare exception to the rule; or, indeed, may be more like an example of the rule, if the tumour were connected with the round ligament, and the therein continuous tissue of the uterus.

In the nerves, as in the uterus, a multiplicity of fibrous tumours may be found; but so far as I know the rule of singleness prevails in every other part liable to be their seat.

The development of fibrous tumours is usually, I believe, through nucleated blastema.

Their growth is often very slow, so that tumours of thirty or more years' standing are found still far short of the enormous dimensions of some of the last species. But no general rule can be made on this point, especially since the rate of growth is influenced by the resistance offered by the more or less yielding parts around.

The extent of growth appears unlimited; and among the fibrous tumours are the heaviest yet known. They have weighed fifty, sixty, and seventy pounds. The tumour that induced Walter to write his admirable essay weighed seventy-one pounds. He refers, also, to one of seventy-four pounds, and to one described in an American journal as having been estimated at one hundred pounds.—*Med. Gazette, July* 18, 1851, *p.* 89.

Fibroid or fibro-plastic tumours—Usual seats and relations—sectional and microscopic characters—Cases of the disease—its aptness to recur—Cases apparently of a malignant form—Account and examples of a peculiar form of recurring fibroid tumours, and of malignant fibrous tumours, with observations on the diseases that seem intermediate between the innocent and the malignant. Fibro-plastic tumours.—M. Lebert has given this name to a group of tumours which he first clearly described. The characters of the group are, in many specimens, well marked, and quite distinct from any other species of tumour that I have yet seen; but I must admit myself unsure at present of the exact boundaries and relations of the group.

The fibro-plastic tumours may be found in many situations. Those which I have been enabled to examine completely have been on the upper and lower jaws, in the mammary gland, and in the neck, near the thyroid gland. M. Lebert mentions, besides these situations, the bones in general, the eyelids and conjunctivæ, the subcutaneous tissue, the cerebral membranes, and the uterus.

In connection with this variety of place, they may vary in external form; but their tendency is to the spherical shape. According to their general consistency, M. Lebert describes two principal varieties—a softer and a firmer. The softer variety, exemplified by the aural polypus, is yellowish, succulent with thin yellow fluid, soft but elastic, rather tough, and, in both general and microscopic characters, like the substance of exuberant weak granulations. The firmer variety is that which alone I have been able to recognise as a distinct tumour, and which alone, therefore, I shall especially describe.

The tumours of this variety, then,—the proper fibro-plastic tumours,—are usually well defined, and either invested with a fibro-cellular capsule, or else easily separable from the surrounding tissues. They feel like uniformly compact masses, but are in different instances variously consistent. The most characteristic examples are firm; and (if by the name we may imply snch a character as that of the muscular substance of a mammalian heart) they may be called "fleshy." Others are softer,

in several gradations to the softness of size-gelatine. Even the firmer are brittle, easily crushed or broken; they are not tough, nor very elastic, like the fibro-cellular or fibrous tumours; neither are they grumous or pulpy; neither do they show a granular or fibrous structure on their cut or broken surfaces.

On section, the cut surfaces appear smooth, uniform, compact, shining, succulent with a yellowish, not a creamy, fluid. A peculiar appearance is commonly given to these tumours by the cut surface presenting blotches of dark or livid crimson, or of a brownish or a brighter blood-colour, or of a pale pink, or of all these tints mingled, on the greyish white or greenish basis-colour. This is the character by which, I think, they may best be recognised with the naked eye, though there are diversities in the extent, and even in the existence, of the blotching. The tumour may be all pale, or have only a few points of ruddy blotching, or the cut surface may be nearly all suffused, or even the whole substance may have a dull modena or crimson tinge, like the ruddy colour of a heart, or that of the parenchyma of a spleen. The presence of cysts containing serous or bloody fluid may modify their appearance, but without obscuring their more essential characters; or, again, varieties may be connected with the locality of the tumour; such as, *e. g.*, that when they grow on or within bones, small osseous particles are commonly scattered through them.

However, among all these varieties, the fibro-plastic tumours are seldom difficult to recognize; they are as well marked as most of the species, and with microscopic help can very rarely be mistaken. The microscope shows that nearly the whole mass is composed of cells and other corpuscles, of which the following are the chief forms:—

1. Cells of oval, lanceolate, or angular shapes, or elongated and attenuated like fibro-cells or caudate cells, having dimly dotted contents with single nuclei and nucleoli.

2. Free nuclei, such as may have escaped from the cells; and among these, some that appear enlarged and elliptical, or variously angular, or elongated towards the same shapes as the lanceolate and caudate cells.

3. As the most peculiar form,—large, round, oval, or flask-shaped cells, from 1-300th to 1-1000th of an inch in diameter, which contain from two to ten or more oval, clear, and nucleolated nuclei, imbedded in clear substance. These are "parent cells," or "brood cells," such as one may find sometimes in actively growing granulations, and such as exist among the essential structures of the thyroid gland.

All these forms of corpuscles lie indiscriminately placed in a dimly granular substance, with abundant granular matter and free nuclei; or else, a material thus composed is traversed by filaments, and bundles of fibro-cellular tissue, and blood-vessels.

Such are the microscopic characters of the fibro-plastic tumours, and these as sufficiently distinguish them from all other innocent tumours, as their general aspects and histories do from the malignant ones.

Now, respecting the histories of fibro-plastic tumours, the cases hitherto observed are perhaps too few and too various to justify many general conclusions. The chief facts are, that these tumours usually occur singly, and most commonly in youth, or before old age, that they gene-

rally grow slowly and without pain, and that they occur without any known cause, such as injury or hereditary disposition. I do not know any degenerations to which they may be prone, and their permanently cellular forms show them to be less apt for development than for growth.

They have not usually any character of malignancy. Lebert's opinion is very decided on this point; and it is confirmed by some of the cases I have watched.

[There are some exceptions to this rule, however. Mr. Paget has seen two cases of the same kind of tumour having a different issue. The same doubts exist, with peculiar force, with regard to the two following groups.]

For one group, the name of "*Recurring Fibroid Tumours*" may, for the present, suffice: their chief characteristics being that their general aspect very closely resembles that of the common fibrous tumours, their microscopic structure is in many respects like that of the fibro-plastic tumours, and the most striking feature in their history is their proneness to return after removal.

Prof. Gluge has given a good general account of the history of such tumours as these, as examples of the forms transitional to cancer. He names them "albuminous sarcoma;" a term one hears frequently used, without perhaps, any clear meaning, yet generally, I think, with the suspicion that the growths to which it is applied are not wholly innocent. Among the cases which he cites, one coincides exactly with those I have met with. A Major, 45 years old, fell from his horse, in 1843. Six or seven weeks afterwards, a tumour appeared over his scapula. It was removed, but after some months returned. Between 1843 and 1848, four such tumours were removed from the same part. In 1848, the patient was under the care of M. Seutin, who removed the fifth tumour, and Gluge's description of this, including the expression that in colour and consistence it was like the muscular tissue of the intestinal canal, leaves little doubt that it was like the less firm of the specimens that I have been describing. In the last of these five operations, and in one previously, the removal of the tumour was followed by free cauterization of the wound; yet the last account published by Professor Gluge was, that in April, 1849, a sixth tumour had appeared in the same part: and he has informed me by letter, that in 1850 the patient died.

It will be observed that in all these cases, recurrence is the only feature in the history of the disease making it resemble the malignant growths. And a case by Dr. Douglas Maclagan, the most instructive of all that have been recorded, proves that this tendency to recurrence may at length cease. The case is related in the 48th volume of the 'Edinburgh Medical and Surgical Journal.'

A girl, 22 years old, had a tumour, of three years' growth, on the left lumbar region about an inch from the spine. In 1832, it was about as large as a Jarganelle pear, firm, but elastic and moveable, and below it was a portion of indurated skin. The tumour and diseased skin were removed, and the former "possessed most of the characters of a simple fibrous tumour." After about twelve months the disease returned in

the scar. Three little tumours formed, and these with the scar were removed freely, in February, 1834. "The extirpated mass bore a striking resemblance to that previously removed." Between twelve and eighteen months later a third growth appeared; which, after increasing for a year and a half, was removed. "It had the same elastic feel and fibrous appearance; and the semitransparent pinkish grey colour was the same as in the original tumour." After this operation no fresh growth ensued, and Dr. Maclagan informs me that the patient remains perfectly well.

[Cases of a similar kind have been described both by Dr. Maclagan and Mr. Syme; and there is one also accurately described and figured by Dr. Hughes Bennett.]

The references to these, and the accounts that I have given of other cases, may suffice to prove the existence of a group of tumours having these remarkable characters in common:—1st. A general resemblance to the fibrous tumours in their obvious characters; 2d. A microscopic texture resembling that of the fibro-plastic more than of any other tumour, yet differing in the absence of the many-nucleated cells; 3d. A tendency to local recurrence after removal, and, in the worst extremity, to protrusion and ulceration, like a malignant growth; 4th. An absence of those events which, in cases of ordinary malignant growths, would coincide with this local recurrence, such as cachexia, and the affection of distant parts, or of the lymphatics.

How may we interpret their singular proneness to recur? Two views may be taken of the facts. The tumours may, from the first, be formed of a cluster or group, and then the removal of one of them only leaves the remainder to continue their growth; or, 2dly, the apparent recurrence may be a real one, such as we suppose occurs in the case of cancers; in which we presume that, in a first operation, every morbid structure already formed in a part is removed, and entirely new growths are produced in the same part.

The former view is supported by whatever of resemblance exists between these and fibrous tumours, whose proneness to multiplicity is remarkable; and by the fact that sometimes, after the removal of one of these, two, or a more numerous group, have appeared in the same part. Yet the objections to this view appear to me more weighty. If we suppose, in any case in which six or seven tumours have been removed in succession from the same part, in as many years, that all began to grow at or about the same time, the last of these ought, according to the rate of growth of the rest, to have come into view much sooner. If the second tumour were not discernible in the first operation, where, or of what size, was the sixth?—or why did it require six or more years to come to the same bulk as the supposed coeval second tumour acquired in one year? It may be added that some of these tumours appear to have recurred in the substance of a scar left after a former operation—in a tissue, therefore, which did not exist at the time of the previous operations. Nor must we overlook, in connection with this apparent aptness to recur, the fact that the later-formed of these tumours may assume certain characters of the thoroughly malignant growths which were not observed

in the earlier. In one of the cases I have seen, the last tumour was, in general aspect, hardly to be distinguished from brain-like tumour, though, in microscopic characters, essentially like its predecessors. In one of Professor Gluge's cases, the transitions to completely malignant characters appeared yet more sure. Mr. Syme also expresses a similar transition; describing, as the usual course of these cases, that, after one or two recurrences of the tumour, the next new productions present a degeneration of character, excite pain, proceed to fungous ulceration, and thus in the end prove fatal. So that, although there be cases in which this evil career has not been run, yet I think we may regard these tumours as approximating to characters of malignancy, not only in their proneness to recur after removal, but in their aptness to assume sometimes the more malignant features the more often they recur. Whatever be the truth concerning the supposed transformation of an innocent into a malignant morbid structure, I think it cannot be doubted that, in the cases of some recurring growths, the successively later growths acquire more and more of the characters of thoroughly malignant disease.

The second group of tumours, which, while bearing an apparent relation to the fibrous tumours, yet exhibit features of malignant nature, are those to which, till their characters are more perfectly known, I would give the name of *Malignant Fibrous Tumours*. In both general and microscopic characters they exactly resemble, I believe, the ordinary fibrous tumours already described; but they differ from them in that they recur once or more after removal, and form not only in their first locality, but in internal parts remote from it.

The most remarkable instance of the kind that I have seen was in a poor widow who was under my care ten years ago. She was forty-seven years old, and had been crippled with acute rheumatism for ten years before she found a small moveable tumour in her right breast. This had increased slowly till seven weeks before I saw her, when, having struck it, it began to grow very rapidly, and became the seat and centre of severe pain. It increased to between two and three inches in diameter, was nearly spherical, very firm, tense, and painful,—even extremely painful. I supposed it to be a large hard cancer, and removed the whole breast.

I found the tumour completely separable from the mammary gland, which was pushed aside by it, but was healthy: the cut surface could not, I think, have been distinguished from that of an ordinary fibrous tumour of the uterus, with undulating white bands, excepting that part of it had a suffused purplish tinge. The whole substance of the tumour had the same characters; and in microscopic examination, often and lately repeated, I could find nothing but tough, compact, well-formed, fibrous tissue, with imbedded elongated nuclei. On boiling, gelatine was freely yielded. In short, I believe it would be impossible to distinguish, by any means but the history, this tumour from a common unmixed fibrous tumour of the jaw or subcutaneous tissue.

Three months after the operation a tumour appeared under the scar. It grew very quickly, and felt just like the former tumour. After two months the thin scar began to ulcerate, and the integuments around sloughed; and shortly the whole of this tumour was separated by slough-

ing, and was removed entire. This also had and still retains every character of the common fibrous tumour.

After the separation of this second tumour, a huge cavity remained, with sloughing walls; then, as the sloughing cleared away, hard knots, like those of a cancerous ulcer, grew up from the walls, and the disease assumed all the characters of a vast and deep hard cancerous sore. In two months she died. I found the ulcer nearly a foot in diameter: its walls were formed of a thick nodulated layer of hard, whitish, vascular substance, like the firmest kinds of medullary cancer. Both lungs contained between twenty and thirty small masses of similar substance imbedded or infiltrated in their tissue; and this substance I have recently again examined, and found to be a complete fibrous tissue, like that of the first tumour removed. I found no similar disease elsewhere.

All the characteristic features of malignant disease were thus superadded to the growth of a tumour which appeared to be, in every structural character, identical with the common innocent fibrous tumour. Nearly the same events were observed in the following case:—In 1835, a man was in St. Bartholomew's Hospital, under the care of Mr. Earle, with a large spheroidal tumour, lying by the base of his scapula, and extending beneath it. It was removed; and I remember it was easily enucleated from the adjacent parts, and was called "albuminous sarcoma;" but it was not preserved. About a year afterwards he returned with a yet larger tumour in the same situation. Mr. Skey removed this, together with a large portion of the scapula, to both surfaces of which it was closely united. The wound was scarcely healed, when another tumour appeared, and increased rapidly. With this the patient died, and growths of similar substance, white, very firm, and nodulated, were found beneath that part of the pleura which corresponded with the growth on the exterior of the chest. I state these particulars from memory; but I have found, from repeated recent examinations, that the tumour removed by Mr. Skey is of fibrous texture, resembling the common fibrous tumours both in general and in microscopic characters, and, like them, yielding gelatine when boiled. It is lobed, with partitions of fibro-cellular tissue, and its several lobes are intersected with obscure opaque white fibres: it is tough, compact, and heavy, and tears with an obscure fibrous grain. It is easily dissected for the microscope, tearing into fasciculi, and appears composed wholly of closely-placed and nearly parallel undulating filaments. A few shrivelled nuclei appear among the fibres, but no cells are distinguishable.

To these cases I may add, though it be an imperfect one, that of a woman from whose back Mr. Lawrence removed a large well-marked fibrous tumour, which had grown nine months after one of the same appearance had been removed from the same part. Before removed, this was judged by all who saw it to be malignant; but it presented a genuine fibrous structure, and could not, I think, be distinguished from an ordinary fibrous tumour.

Such are the cases which make me believe that tumours occur, resembling in all respects of structure and chemical composition the fibrous tumours of the uterus (exeepting their muscular fibres), or of the bones or subcutaneous tissue, yet differing from these in that they pursue a course

like that of cancers, recurring after removal, growing at the same time in internal organs, tending to sloughing or ulceration, and in these processes involving adjacent structures. I have related only cases in which the fibrous structure was proved by microscopic examination; but I have little doubt that others might be added from the cases of tumours of the jaws and other bones, believed, from their general appearance, to be fibrous, yet pursuing a malignant course. I will only add that these are not such growths as those which Müller and others have named Carcinoma fibrosum, and which, I believe are always infiltrations in the substance of the affected organs, including cancer-cells with their fibrous tissue, and having in this tissue such hardness, stiffness, and other peculiarites of structure, as make it easily distinguishable from the normal fibrous tissue and its imitation in the fibrous tumours.—*Med. Gazette, Aug.* 1, 1851, *p.* 177.

Cartilaginous tumours.—General characters and relations, when growing in soft parts, and on or in bones—their rates of growth—degenerations and defects.—[Mr. Paget next proceeds to the general character and relations of cartilaginous tumours. He says,]

The name of cartilaginous tumours may be given to those which Müller, in one of the most elaborate portions of his work on Cancer, has named Enchondroma. Either term will sufficiently imply that the growth is formed mainly of a tissue like cartilage; and I would at once point out the singularity of such tumours being formed, and growing to so great a size as I shall have to describe, although cartilage is not formed for the repair of its own injuries, nor, at least in man, in a perfect manner, for the repair of the injuries of bone.

The cartilaginous tumours are found, in the large majority of cases connected with the bones and joints. However, they occur not rarely in soft parts, completely detached from bone. Thus, in the pure form, or mixed with other tissues, they are met with in the testicle, mammary gland, subcutaneous tissue, and lungs, and in the soft parts near bones; but among all the soft parts their favourite seat appears to be the neighbourhood of the parotid gland. The greater part of the solid tumours formed in this part have more or less of cartilage in them.

Cartilaginous tumours that are connected with bones may occur in two distinct positions—namely, within the walls, or between the walls and the periosteum; very rarely they grow in both these positions at once. When they are within the bones they are isolated and discontinuous, and are surrounded by the walls, which may be extended in a thin shell or capsule of bone around them, or may be wasted and perforated by them. When they grow outside the bones they are generally fastened to the subjacent bone-wall by outgrowths of new bone; the periosteum, greatly overgrown, invests them, and prolongations from it towards the bone appear to intersect them and divide them into lobes. When they grow among soft parts they have a well-formed fibro-cellular or tougher fibrous capsule, which is commonly more dry and glistening than that of most innocent tumours.

Their rate of growth is singularly uncertain. They may increase very slowly. I have seen one not more than half an inch long which had been

at least four years in progress. Or, after a certain period of increase, they may become stationary; as often happens in the tumours that occur in large numbers on the hands. Or, from beginning to end, their growth may be very rapid. I remember a man, about forty years old, in St. Bartholomew's Hospital, in whom, within three months of his first noticing it, a cartilaginous tumour increased to such an extent that it appeared to occupy nearly the whole length of his thigh, and was as large round as my chest. He had a pale unhealthy aspect, and suffered much from the growth; and its size and rapid growth, the tension nearly to ulceration of the skin over it, the enlarged veins, and loss of health, made all suppose it was a great malignant tumour. Mr. Vincent, therefore, decided against amputation of the limb, and the patient died exhausted within six months of the appearance of the disease. The examination after death proved that a great cartilaginous tumour, with no appearance of malignant disease, had grown within and around the middle two-thirds of the femur. The bone, after extension by the growth within it, had been broken, and all the central part of the tumour was soft, nearly liquid, and mixed with fluid blood and decolorised blood-clots.

The principal defect or degeneration noticeable in cartilaginous tumours is manifest in their being extremely soft, or even liquid,—a clear, yellow, jelly-like, or synovia-like material appearing in the place of cartilage. I call it a defect or a degeneration, because it is not always certain whether it is the result of cartilage, once well-formed, having become soft or liquid, or whether the soft or liquid material be a blastema which has failed of gaining the firmness and full organization of cartilage. The condition in which it is sometimes found can leave little doubt, I think, that it is often a degeneration,—a liquefaction of that which was once more perfectly nourished; but in other cases we have no guide to its interpretation, and it is quite probable that the same defective structure would be found in arrests of development as in degeneration.

Particular illustrations of cartilaginous tumours connected with the several bones of the limbs, jaws, cranium, and spine.—It may serve for additional illustration of this general pathology of cartilaginous tumours, if I describe now some particular forms of them.

I have said that they affect particularly the bones. The bones of the hands are their most frequent seats, and next to these, the adjacent extremities of the femur and tibia, the parts which, for some inexplicable reason, appear to have in all the skeleton the least power of resistance of disease. After these, the humerus, the last phalanx of the great toe, the pelvis, and the ribs, appear most liable to cartilaginous growths; and after these, the number of cases is as yet too small to assign an order of frequency, but there is scarcely a bone on which they have not been seen.

Of the cartilaginous tumours of the large long bones I need say little, having drawn from them the greater part of the general description. Only, the relations of the growths, according to the part of the bone in or near which they lie, may be worth notice.

When, then, the tumour grows at or about the articular end of a

large long bone, it is almost always placed between the periosteum and the bone. Here it usually surrounds the bone, but not with an uniform thickness; and the thin wall of the bone wastes and gradually disappears as if it were eroded, or as if it changed its form, becoming cancellous, and then growing into the tumour, as I have already described. I have never seen such a tumour encroaching on the articular surface of a bone. But it may grow up all about the borders of the joint and surround them. A striking example of these relations of the cartilaginous tumour to the bone on which it grows is in one of the finest specimens in the Museum, a cartilaginous tumour of the humerus, removed in an amputation at the shoulder-joint by Mr. Liston. The patient was a naval surgeon, and the tumour had been growing for nearly forty years. The mass it now forms is nearly ten inches across; it surrounds the upper three-fourths of the shaft of the humerus, and nearly surmounts its articular surface. The abundant isolated nodules, the partial central ossification and central softening, the growth of bone from the cancellous tissue of the humerus into the tumour,—all these, and many other of the general statements I have made, are here well shown.

It is extremely rare, I think, for a cartilaginous tumour to grow within the articular end, or in the medullary tissue near it, in a large long bone. Here is, however, a striking specimen presented by Mr. Langston Parker to Mr. Stanley. It was removed by amputation of the lower part of the leg, from a young gentleman in whom it had grown slowly, and had distinctly pulsated. The lower end of the fibula is expanded and wasted by a growth of cartilage, mixed with what appears to be fibro-plastic tissue. The growth is rather larger than an egg, and is invested by the remains of the expanded fibula, and by the periosteum; and the relations of the chief blood-vessels make it probable that the pulsation felt during life must have been derived from that of the vessels within the tumour.

When a cartilaginous tumour grows at the middle of the shaft of a large long bone, it is, I think, usual to find coincidently both an external and an internal growth. Cartilage lies outside the shaft, beneath the periosteum; and another mass may fill the corresponding portion of the medullary canal. Then, in the concurrent growth of the two masses, the wall of the bone between them wastes or is broken up, and they may form one great tumour set between the ends of the shaft. These are the cartilaginous tumours which most imitate the progress of malignant disease. They are indeed very rare; but the chance of the existence of such an one where we might be anticipating a malignant tumour, is always to be added to the motives for amputation in cases of tumours round the shafts of these long bones.

When cartilaginous tumours grow at the attachment of tendons (and they often do so, especially about the lower part of the femur), they are peculiarly apt to acquire narrow bases of attachment. In these cases one usually finds a layer of cartilage incrusting some cancellous and medullary bone, and the bone, narrowing itself, extends into continuity with the wall or the cancellous tissue of the subjacent shaft. Such tumours have, then, the characters of polypoid outgrowths from the bone, and may be treated accordingly; for, when cut or broken off, their stems (at least, if they consist of only bone) will not grow. Indeed, this

stem may chance to be unwittingly broken, as in a tumour removed by Mr. Lawrence. It had grown on the inner and lower part of the femur, and, when fairly exposed, was easily detached without further cutting: the narrowest part of its stem rested in a slight depression in the femur, but had no connection by tissue with it. It seemed as if the narrow pedicle of a tumour, so large as this was, had been by accident broken off, and that friction of the broken surfaces had smoothed and fitted them together.

Such are some of the chief facts to be noted about the cartilaginous tumours on the large long bones.

On the jaws these tumours are, I believe, very rare. I know but one specimen on the upper jaw alone,—a great tumour, portions of which are preserved in the Museum of Guy's Hospital, and of which the history, by Mr. Morgan, is in the Hospital Reports.

On the lower jaw such tumours appear prone to acquire a peculiar shape, affecting the whole extent of the bone. One of the most remarkable tumours in the Museum of the College is of this kind. The patient was a lady thirty-nine years old. The tumour had been growing eight years; it commenced as a small hard tumour just below the first right molar tooth, and gradually enlarged till it enclosed the whole jaw, except its right ascending portion. It measured two feet in circumference and six inches in depth, and the patient died exhausted by want of food, which she was unable to swallow, and by the ulceration of parts of the tumour during the last two years of her life.

M. Lebert has recorded a case in which a tumour like this was removed by Dieffenbach. In three successive operations he removed it by instalments, and the patient finally recovered.

The cartilaginous tumours that grow about the cranial bones and the vertebræ show, in a marked manner, that reckless mode of growth (if I may so speak) which is more generally a characteristic of malignant tumours. They grow in every direction; pressing, and displacing, and leading to the destruction of important parts, and tracking their way along even narrow channels.

Here, for example, is a tumour, composed, for the most part, of cartilage, which grew in connection with the bones of the face and head of a lad sixteen years old. It involved both superior maxillary bones, extended into the left orbit, and through the left side of the base of the skull into its cavity, compressing the anterior lobes of the cerebrum: it was also united to the soft palate, and protruded the left nostril, and the integuments of the face.

The commencement of a similar growth is probably shown in a specimen, in which, together with changes effected by the growth of nasal polypi, one sees the ethmoid cells completely filled with firm semitransparent cartilage, a mass of which projects in a round tumour into the upper part of the left nasal fossa.

And here I may adduce, in proof of the tracking growth of the cartilaginous tumours, the case of one originating in the heads of the ribs, which extended through the intervertebral foramina into the spinal canal, where growing widely, and compressing the spinal cord, it produced complete paralysis of the pelvic organs and the lower extremities.—*Med. Gazette, Aug.* 8, 1851, *p.* 221.

Glandular tumours.—Occurrence in connection with the mammary, labial, thyroid, and prostate glands—Relation to Proliferous cysts—Mammary Glandular tumours—usual seat and relations—chief varieties of apparent structure—Labial and Prostatic Glandular tumours.—[Mr. Paget proceeds now to the discussion of glandular tumours. First, of their definition, he says,]

We may call the tumours "glandular" that, in their structure, imitate the glands, whether the secreting glands, or those organs which we name glands, because, though having no open ducts, they are of analogous structure.

The most frequent example of these glandular tumours is the kind which imitates, and occurs in or near, the mammary gland; the chronic mammary tumour of Sir A. Cooper; the pancreatic tumour of Mr. Abernethy; the fibrous tumour of the breast of M. Cruveilhier. Other tumours of the same general kind are more rarely found in the lips, and in or near the prostate and the thyroid glands. Probably, too, some other tumours, to which no name, or a wrong one, has been hitherto assigned, may yet have to be placed in this group; indeed, I think it very probable that there are certain lymphatic gland-growths which we usually regard as enlarged glands, but which are really of the nature of tumours, even in the most limited sense of the term. At present, however, I will speak of only such gland-tumours as may be clearly recognised,—namely, the mammary glandular tumour, the labial, and the prostatic. I have already spoken of the thyroid, and of those which may imitate the parotid.

Some of the pathology of these tumours has heen already sketched in the account of the glandular proliferous cysts. To that account I may again refer, so far as to the point at which it is believed that an intra-cystic growth has completely filled the cyst in which its growth began, and has coalesced with the walls, so as to form a solid tumour.

Now, it is, perhaps, probable that all glandular tumours may be formed after this plan: for, in those occurring in the breast, we find sometimes one circumscribed mass composed half of a proliferous cyst, and half of a solid glandular tumour; sometimes two such growths lie apart, yet in the same gland; and often, we find such structures as we doubt whether to call proliferous cysts nearly filled, or mammary tumours.

However, if all the mammary and other glandular tumours are thus of intra-cystic origin, it must be admitted that many of them must very early lose the cystic form, and continue to grow as solid masses; for we find them solid even when they are very small, and they are traced growing from year to year, yet apparently maintaining always the same texture.

I shall speak now of the solid tumours alone; and, first, of the Mammary Glandular tumours.

Sir Astley Cooper may be said to have had a good insight into their nature, when he called them "chronic mammary," and said they were "as if nature had formed an additional portion of breast, composed of similar lobes." But I believe nothing more than this general likeness had been observed, till these tumours were examined with the microscope by M. Lebert, who found in them the minute glandular structure

imitative of the mammary gland, and recognised many of their relations to the proliferous cysts. Mr. Birkett, by independent and contemporary observations, made on the great collection of these tumours in Guy's Hospital, confirmed and extended the conclusions of M. Lebert, and has cleared up much of the obscurity that existed previous to his inquiries. Both these gentlemen apply such terms as "Imperfect Hypertrophy of the mammary gland" to these tumours: hut highly as I esteem their observations (and not the less, I hope, because they corrected errors of my own), I would rather not adopt their nomenclature, since if we do not call these "tumours," I hardly know to what innocent growths the term could be applied. Nearly all innocent growths are imperfect hypertrophies, in the same sense as these growths are; nay, these are, in many respects, the very types of the diseases to which the name of tumours is by general consent ascribed, and which can be distinguished, even in definition from what are more commonly regarded as hypertrophies.

The mammary glandular tumours may be found in any part of the breast,—over, or beneath, or within the gland, or at its border. Their most rare seat is beneath the gland; their most common at its upper and inner part, imbedded in, or just beneath, its surface. They are usually loosely connected with the gland, except at the deepest part, where their capsules are generally fastened to the gland; but the connection is of so small extent that they slide very easily under the finger, and are peculiarly moveable in all directions.

The tumour is commonly of oval shape; superficially, or sometimes deeply lobed, or nodular; firm, or nearly hard, elastic, and often feeling like a cyst tensely filled with fluid. The parts around appear quite healthy. The mammary gland is pushed aside; but it undergoes no other change than that of atrophy, even when stretched over a tumour of the largest size. The skin under distension may grow slightly livid, but else is unchanged. The tumour is usually invested with a complete capsule, isolating it from the surrounding mammary gland, and often adhering less to it than to the gland. This capsule may appear only as a layer of fibro-cellular tissue, like that round any other innocent tumour; but it is not unfrequently more perfectly organized in layers, and smoother on its inner surface; conditions that we may perhaps ascribe to its having been a perfect cyst within which the glandular growth originated, and which it only lately filled.

On section, these tumours present a lobed construction, in which it is sometimes not difficult to discern the remains, or the imitation of the plan, of the lobed, and foliated and involuted intra-cystic growths. In some, the fibro-cellular partitions among the lobes converge towards the centre of the mass, as if they were the remains of clustered cyst-walls; or there may remain a cavity in the centre of the tumour, as if clustered cysts and growths had not quite filled up the space. In some, however, no such plan is discernible; the whole mass is disorderly lobed, and its lobes have the shapes derived from accidental mutual pressure, and are bounded by loose fibro-cellular partitions.

In structure as in construction, these tumours may present several variations; but they may be artificially arranged in three or four chief groups.

Some are really very like the normal mammary gland in an inactive state. These have a pure opaque-white, and soft, but tough and elastic, tissue; they are lobed and minutely lobulated, with undulating white fibres. Such an one is well shown in a specimen from Sir Astley Cooper's collection, in which, moreover, his injection of the blood-vessels shows a moderate vascularity, about equal to that of the surrounding normal gland substance.

We might take such as this as examples of the medium form of this kind of tumour; and the other chief or extreme forms are represented by those which deviate from this in two directions. In one direction we find much softer tumours; these, though closely textured, are soft, brittle, and easily crushed; their cut surfaces shine, or look vitreous or half translucent; they are uniformly greyish-white, or have a slight yellowish or pink hue, which deepens on exposure to the air; or they may look like masses of firm, but flickering jelly; and commonly we can press from them a thin yellowish fluid, like serum or synovia. Such as these have the usual lobed and lobular plan of construction; and I think the intersecting partitions commonly extend from a firm, fibrous-looking central or deep part, towards the circumference of the tumour.

In the other direction from the assumed average or medium form, we find firmer tumours. These have a dryer and tougher texture; they are opaque, milk-white, or yellowish, like masses of dense fibro-cellular tissue, lobed, and having their lobes easily separable, as in this great specimen of seven pounds weight.

To such as these varieties we might add many, due not merely to intermediate forms, but to the degrees in which the intra-cystic mode of growth is manifested; or to the development of cysts, which may take place as well in this new gland-tissue as in the old; or to the various contents of these cysts, whether liquids or organized growths.

I believe we cannot at present always connect these various aspects of the tumours with any corresponding varieties in their histories. Neither, I think, have any investigations proved more of the corresponding varieties of microscopic structure, than that, as a general rule, but only a general one, the tougher any tumour is, the slower its growth has been, and the more it has of the fibro-cellular, mingled with its glandular, tissue; and that the more succulent and vitreous it is, the less perfectly is the glandular tissue developed, and the more rapid is the growth.

Respecting the origin of these tumours, little more, I believe, can be said than that, occurring most commonly in young unmarried or barren women, their beginning often seems connected with defective or disordered menstruation. The law which, if we may so speak, binds together in sympathy of nutrition the ovary and the mammary glands, the law according to which they concur in their development and action, is not broken by one with impunity to the other. The imperfect office of the ovary is apt to be associated with erroneous nutrition in the mammary gland.

Labial Glandular Tumours may be briefly described, for their general characters correspond closely with those of the foregoing kind; or, they may appear intermediate in character between the foregoing and those tumours which I described as lying over or near the parotid gland, and

as consisting of mixed glandular and cartilaginous tissue. Their likeness to these tumours over the parotid was manifest to Mr. Lawrence, who has added to his account of the tumours by the parotid, the only case of labial glandular tumour that I have found on record.

Prostatic Glandular Tumours are examples of the abnormal growths by which tumours appear to be connected with simple hypertrophies of organs.

We owe to Rokitansky the knowledge, that the tumours in the prostate gland, which were commonly, and till lately even by himself, regarded as fibrous tumours, are composed of tissues like those of the prostate gland. In enlarged prostates they are not unfrequently found. In cutting through the gland, one may see, amidst its generally lobed structure, portions which are invested and isolated by fibro-cellular tissue, and may be enucleated. Such portions have, I believe, been sometimes removed as tumours, or as portions of prostate-gland, in operations of lithotomy. They lie imbedded in the enlarged prostate, as sometimes mammary glandular tumours lie isolated in a generally enlarged breast. They look like the less fasciculate of the fibrous tumours of the uterus; but, to microscopic examination, they present such an imitation of the proper structure of the prostate itself, that we cannot distinguish the gland-cells or the smooth muscular fibres of the tumour from those of the adjacent portions of the gland. Only their several modes of arrangement may be distinctive.

At present the examinations of these tumours have been too few to furnish a complete history of them: neither can I add any cases or references to specimens to those which were adduced in the first lecture. Indeed, at present, the chief or nearly the whole interest of these tumours lies in those relations to general pathology to which I then referred: their surgical relations have at present, I believe, been scarcely studied.

Vascular or Erectile Tumours—Principal varieties: arterial, venous, and capillary.—The *Erectile* or *Vascular Tumours* include most of the diseases which are described as vascular nævi, and of which the types are the subcutaneous nævi. Among them, also, are the growths to which John Bell gave the name of aneurism by anastomosis, and those which have been called Telangeiectasis.

The name "erectile tumour" has, of late years, come into general use, as expressing a principal fact concerning these diseases, namely, that many of them resemble very closely in their texture that of erectile or cavernous tissue. Mr. Humphry has, indeed, rightly objected to the use of the term, that these tumours present no imitation of the erectile tissue in the power of filling themselves with blood, as if by some internal force. But, since this power of the true erectile tissue depends as much on the accessory structures of nerves and muscles as on the tissue itself, we may perhaps apply the term "erectile" to the tumours, remembering only for this, as for other structures occurring in tumours, that the imitation of the natural tissue is imperfect, or partial. However, if any be scrupulous in the use of these terms, we may call these tumours vascular, or cavernous, or even Telangeiectasis.

The likeness which these tumours bear to the erectile tissue, as exem-

plified in the corpus cavernosum penis, is sometimes, in general appearance, perfect. A well-marked specimen is in the Hunterian collection; it was removed from under the lower jaw, and its cut surface displays a close network or sponge of fine, smooth, shining bands and cords, just like those of the corpus cavernosum penis, only less regular in their arrangement.

The essential structures of the disease are, according to these descriptions, derived from such a growth of blood-vessels, or rather of blood-spaces, that, in imitation of erectile tissue, the arteries are numerous but comparatively small, and, as we may believe, the capillaries or intermediate vessels open into veins so large, and so closely branching and anastomosing, that scarcely any continuity of tube can be discerned. Thus the whole mass seems formed of cells or spaces, opening widely into one another: and no remains exist of the walls of the veins, or of the tissue naturally lying between blood-vessels, except those narrow bands and cords that bound and intersect the cell-like spaces. .

But while this form of tumour, in which the erectile tissue is imitated, may be taken as, in some sense, typical, we find, on either side of it, deviating forms. In some instances, the enlargement of arteries far exceeds that of veins; the swellings pulsate, and are florid and over-warm, and the tissues forming them may appear, for a time at least, hypertrophied. Some, I think, have described such arterial tumours as formed by the convolutions of a single artery, but they seem more commonly to be due to the dilatation of many anastomosing and closely clustered arteries. Such was the case in an instance recorded by Mr. Coote: arteries of the lip, which, in their natural state, might not have had a greater diameter than a large pin, were dilated for about an inch of their course into sinuses or canals, and were equal in diameter to the adult radial artery. Similar to this was a very formidable case, lately cured by compression, under the care of Mr. Lloyd. The temporal, supraorbital, and occipital arteries, all exceedingly dilated and tortuous, converged to a large pulsating swelling over the sagittal suture.

On the other side are tumours formed mainly of overgrown, dilated, and sacculated veins. Arterial branches may, and I think usually do, pass into these; but some of these tumours seem wholly venous, as if all the dilatation of vessels were beyond the capillaries; and in these cases Rokitansky's expression is very applicable, that the circulation through the tumour may be compared with that through a portal vein.

Hence, speaking generally, it may perhaps be rightly stated, that among these vascular or erectile tumours, that which is common to all is an over-extension of blood-vessels or blood-spaces within a circumscribed space. We may assume that in different cases the change may chiefly affect either the arteries or the veins; or that it may affect both in such proportions as to produce an exact structural imitation of the erectile tissue. Or, we may assume that, in all cases, the capillary blood-vessels are the chief seats of the dilatation: and that as they grow they may, according to the state of the circulation in them, and their relations to other blood-vessels, have the character of arterial or venous plexuses. This last interpretation is as consistent as the other with the observed appearances of the vascular tumours, and is more easily recon-

ciled with a fact that may be occasionally observed; namely, that "a nævus, which seems at first to consist only of arteries, after a time begins to exhibit veins under and around it, which veins may ultimately compose the larger part of the tumour."

Whichever explanation we may adopt, the differences among these tumours naturally suggest that they should be called "arterial," or "venous," according to the character of vessels or of blood of which their mass consists. And a third intermediate form may pass by the name of "capillary," if it appear that the intermediate blood-vessels are the chief seat of dilatation and abnormal anastomosis.—*Med. Gazette, Aug.* 22, 1851, *p.* 309.

155.—CASES OF EPITHELIAL CANCER.

Epithelial Cancer of the Tongue. Under the care of J. Erichsen, Esq.—[From the notes of Mr. Turle, the dresser of the patient, we have the following account of this interesting case.]

Maria Boynes, aged 69, thin and pallid, but not markedly cachectic, was admitted into University College Hospital, July 16, 1852. She had been an out-patient, under Mr. Marshall, for some months, on account of a gradually increasing tumour at the tip of the tongue, which she had first noticed as a firm pimple two years previously. It was nearly circular, an inch and a quarter across, and extremely hard. No actual ulceration existed, but its surface was smooth and red, and its edges very irregular. On the left side of the tongue, near the root, was a patch of superficial abrasion the size of a shilling, presenting a healthy surface, and unattended by induration. None of the submaxillary glands were sensibly enlarged. She had lost all her teeth, and been restricted to soft food for a long time; her pulse was feeble, 96; and, during the last few weeks, her strength had perceptibly declined. The malignant character of the disease had been recognised from the first, and its removal recommended, but she had declined to submit to it; finding, however, that it increased in size, and was becoming the seat of aching pain, she was now anxious to get rid of it. As the indurated lump was the part alone productive of discomfort, and as the other patch possessed no cancerous characters, it was decided to remove only the former.

July 21. A needle, armed with a double ligature of thin whip-cord, was passed through the middle of the tongue, a little behind the diseased mass, and the two halves of the string tied as tightly as possible on the opposite sides of the organ, so as to strangulate the whole of its distal portion. The operation was conducted under chloroform, and was productive of very slight hemorrhage.

22nd. She has slept well, and is able to take fluid food,—milk, eggs beat up in wine, etc.

23rd. The sloughy mass was removed by an incision just in front of the ligature, which caused no bleeding.

29th. The surface of the wound has now lost its sloughy character, and is covered with healthy granulations; her mouth feels much more

comfortable than before the operation; she sleeps well, takes her food, and can articulate with tolerable plainness.

August 3. She is discharged, much pleased with the result of the operation. The end of the tongue presents a puckered and indurated cicatrix; the sore on its side is just in the same state as before; she has now no pain whatever, sleeps well, and has decidedly improved in appearance.

Sep. 17. The cicatrix is perfect, and much less indurated than it was a month ago, and she continues free from pain and in good health. On the right side of the tongue has appeared a superficial non-indurated ulceration, very similar to that previously noted on the left; they are both level with the surface, florid, and granulating; they produce so little pain, that she did not know of the formation of the second.

For the removal of tumours of the tongue, the surgeon has choice of three methods, each possessing peculiar advantages:—amputation by the knife gets rid of the whole mass at once; strangulation by means of ligature prevents any loss of blood; excision performed carefully with a wire heated by galvanism accomplishes both these objects at the same time. As the latter instrument appears to be easily manageable, it is not improbable that it may, when better known, in a large proportion of cases, supersede the other two. It must, however, be admitted, that, unless handled carefully, and made to cut its way very slowly, the risk of bleeding is not obviated, as it is necessary to that effect that it should have time to *cauterise* the parts as it divides them.—*Med. Times and Gazette, Oct.* 16, 1852, *p.* 389.

Large Cancerous Sore on the Back of the Hand.—Amputation.—Recovery. Under the care of J. PAGET, Esq.—Patrick Keller, aged 62, a bricklayer's labourer, a thin, dry-fibred man, was admitted into St. Bartholomew's Hospital, July 1, 1852. The back of his left hand was covered by one large ulcer, which extended from side to side, and at each border turned round a little into the palm. Its margins were ragged, raised and very firm, everted in some parts, and undermined in others, always abrupt. The surface was covered with florid granulations, discharging good pus, and was crossed in several parts by bands of commencing cicatrisation. It had commenced a year and a half previously as a large and painful wart, in the middle of the back of the hand, which had continued to enlarge without ulcerating for a year, when he went into St. Giles's Workhouse, and had caustics applied, since which time the ulceration had rapidly spread. It appeared that he had been accustomed to be employed several days in each week in setting stoves and fire-places, during which occupation his hands necessarily came in contact with much soot.

Excepting some parts of its border, this sore presented none of the usual features of a malignant one; its base was in fact healthy, and even in process of cicatrisation, and in no part was there deposited anything like a defined mass of induration. Its appearance had, however, been masked by repeated escharotic applications; and, during the fortnight that he was kept under observation previous to the operation, it assumed more of its proper characters. Continuing to spread rather rapidly, it had in that time crept further round the inner border of the palm, and

the appearance it here presented was decisive. The edge was elevated, sinuous, everted, and very firm; the surface covered with a greyish secretion, and destitute of granulations. It was decided to remove the whole hand.

July 16. A double-flap amputation was performed in the lower third of the fore-arm. No unusual circumstances attended the operation, and the process of healing, although it progressed very slowly, was not accompanied by any unfavourable occurrences. The juice scraped from the cut edges of the ulcer exhibited the microscopic characters of epithelial cancer.

Chimney-Sweep's Cancer Affecting Primarily the Inguinal Glands—Excision—Recovery. Under the care of J. PAGET, Esq.—It is customary to attribute the form of cancer so commonly occurring in chimney-sweeps, to the local irritation of the soot to which they are exposed. Thus the reason of its preference for the scrotum is found in the peculiar rugose condition of the skin of that part being well calculated to lodge and retain the irritating particles. To this view it may be objected, that the disease is, in some stages at least, evidently a constitutional one; that it will break out in those who have long abandoned the trade; and that a tendency to it appears to be capable of transmission from father to son, as it occasionally occurs in individuals of the latter class, who have themselves been little, if at all, exposed to the influence of soot. Then, again, its prevalence appears to be almost restricted to a few English cities; and it is not known among certain large classes of men who are constantly exposed to one or other kind of carbonaceous dust. These facts are calculated to suggest the inquiry as to whether the influence exerted by this trade may not be of a more general character,—that is, whether the filth, the degraded habits common amongst these men, the inhalation of noxious matters, &c., may not conjointly effect such a deterioration in the constitutional power of the exposed individuals, as to render them peculiarly liable to the supervention of malignant diseases. If this were granted, it would be easy to account for the preference shown by the disease for a part which is constantly exposed to irritation amply sufficient to localise its outbreak. To suppose soot capable of originating merely by its mechanical action, a specific and malignant disease, is certainly to endue it with powers such as no other substance is known to possess. In reply to this, it might, however, be urged that chimney-sweep's cancer is often of not nearly so virulent a character as the other forms of the disease, that it may be excised with good hopes of securing to the patient a long period of health, and that, in short, it does frequently appear to be really a local, rather than a constitutional affection. It might also be alleged, that it is not uncommon for a disease at first purely local, (syphilis for example,) to contaminate the system generally, and become capable of being transmitted to the offspring. We have not space here to enter fully on the question, and shall abstain from giving any definite judgment on it, as it is our wish rather to record facts than hastily to pronounce opinions. On each side, facts may be cited, and the above case appears to bear in a different direction from the one which is to follow. In that just related, a man, engaged in an occupation which, whilst not of itself prejudicial to health

necessitated the exposure of his hands to the irritation of soot and rubbish, had a cancerous wart form on the very part thus exposed. In the following one, however, a chimney-sweep, in whom there was no reason to suspect hereditary predisposition, was attacked by primary epithelial disease in parts which, from their subcutaneous situation, could not possibly have been subjected to the mechanical irritation of soot. The latter, if not a unique case, is at least one of extremely rare occurrence; were it otherwise, the truth of the principle would be nearly established, that the peculiar influence which this unfortunate trade exerts, is a constitutional, and not a purely local one.

William Isaacs, aged 48, a thin and cachectic-looking man, who had been for forty years constantly employed in sweeping chimneys, but whose father had not followed that trade, was admitted August 10, 1852. In his right groin was a large ulcer, with ragged and sinuous edges, covered with firm sprouting granulations, and discharging a thick dirty secretion. The glands below and around it were enlarged, and of extreme induration. In the left groin was a cluster of glands the size of an egg, swollen, and very hard, but not ulcerated. He stated that his attention had been first drawn to the disease by severe pain in the right groin four months ago, when he found a small lump so hard that he thought it was bone, which adhered to the skin, but did not involve it. It gradually increased in size, and occasioned him such severe pain that he had latterly been obliged to keep his bed. Having slowly suppurated and become prominent, it broke about a week before admission, and discharged a small quantity of thick glutinous stuff, after which the pain was much relieved. The enlargement in the left groin had only been noticed for three weeks. Respecting the place of the first occurrence of the disease, he expressed himself as quite certain that he had not had any wart or ulceration on any other part, and careful examination revealed nothing calculated to throw doubt on his statement. The skin of the scrotum was remarkably clean and soft; and although, in several parts of the body, especially the face, the skin was rough, and covered with little firm papules, yet nowhere was there anything amounting to a wart.

August 14. Mr. Paget removed the diseased parts from each groin. Those on the right side required a long and careful dissection, as they ran deeply and lay close to important structures. The wound left was consequently a very large one.

17th. He still suffers considerable pain, though not nearly so much as before the operation. He is very feeble, and looks ill.

℞. Quin. disulph. gr. j., acid. sulph. dil. ♏x., aquæ puræ ℥j. ter die.

℞. Tinct. opii ♏xx. o. n.

Sep. 2. A mass of firm sprouting granulations, of very suspicious appearance, having sprung up in the centre of the right wound, it was treated with a paste composed of equal parts of chloride of zinc and flour.

Rep. haust.

12th. The application of the caustic gave him great pain for twenty-four hours, but he has since been much more comfortable; sleeps well, and is steadily improving. The wounds are healing, and look satisfactory.

Oct. 2. He has gained flesh and colour considerably. The wound in the left groin is all but healed, and that in the right is much contracted and covered with healthy granulations. He sleeps well, and suffers no pain whatever, and there appears every reason to believe that the process of cure will soon be completed.

The above case affords much encouragement to the practice of excising glands under similar circumstances; for since it was at first very doubtful whether it were practicable to remove the whole diseased parts, the result has been highly satisfactory, and the more so because, from the rapid progress which the disease was making, it must evidently have soon induced a fatal termination. The case is very interesting, not only as affording an example of chimney-sweep's cancer affecting a part to which soot could not possibly have been applied, but also of malignant disease primarily occurring in the lymphatic glands, both of which phenomena are extremely rare.

Chimney-Sweep's Cancer three times excised.—Return in the Inguinal Glands.—Excision.—Recovery. Under the care of E. STANLEY, Esq. —John Britton, aged 40, the son of a chimney-sweep, and himself brought up to the trade from the age of five years, was admitted into St. Bartholomew's Hospital, May 14th, 1852. He stated that, when twenty-one years old, a large, ragged soot wart made its appearance on his scrotum, which, after having lasted a year, and become extremely painful, he cut off himself with a razor. Much alarmed lest it should return, he soon afterwards abandoned his business, and became a street-hawker, and was never after in the least exposed to soot. This change of life, however, did not prevent the return of the disease, which took place about six years afterwards, and was, after having lasted near two years, and formed a large ragged ulcer, again excised by Mr. Lawrence. Five years after this, it again returned, but spread so slowly, that he did not think it worth while to submit to operation until a year ago, when it was again cut out by Mr. Lloyd. Hitherto the scrotum had been the only part affected, and all the operations had been rapidly recovered from; two months after the last, however, the inguinal glands on both sides began to enlarge, and have continued to increase up to the present time. In each groin there were now several tumid glands, those on the left side being the most advanced; one of which had softened, and presented the sense of fluctuation. It differed, however, from an ordinary bubo, in being more conical and projecting, and in having around it less of diffused swelling and redness, while its circumscribed induration was much more extreme. On being punctured, a few drachms of thick, greyish, pultaceous matter were squeezed out, which contained great numbers of large, oval, very granular, epithelium scales, but none of the ordinary pus cells. The glands on the right side were merely indurated, without any softening.

On May 15th, Mr. Stanley dissected out the diseased glands, together with portions of the surrounding tissues which had been implicated with them. In each side the gland structure was infiltrated with epithelial deposit. The wounds, though large, healed favourably, and he was discharged in a few weeks quite well.

Epithelial Cancer of the Penis.—Amputation.—Recovery.—Under the care of J. PAGET, Esq.—John Vincent, aged 33, a farrier, stout, muscular, and, excepting a slight pallor, healthy looking, was admitted July 27, 1852, on account of a disease which presented the following appearances:—Over the base of the glans penis, a little to the right side, was a large ulcer, which perforated the prepuce, and exposed the corona glandis. Its edges were sinuous, everted, much raised, and overhanging a marked constriction which surrounded their base. They, as well as the portion of glans which projected into the sore, were covered with firm, sprouting granulations, almost resembling small warts. The prepuce was in a condition of congenital phymosis, and it, together with the integument of the penis, was acutely inflamed and much swollen. Above the ulcer, on the body of the penis, were several small, isolated collections of unhealthy pus, over which the skin was livid. The whole was extremely sore and tender to the touch. There were no enlarged glands in either groin, and the odour exhaled from the ulcer was very little, if at all, fetid.

The history he gave of the affection was, that three months previously, while suffering from a slight gonorrhœa, he received a bruise on the penis from a horse which he was shoeing, and, three weeks after this accident, he first noticed that the prepuce on the right side was somewhat elevated by a soft swelling beneath it. In a little time general inflammation of the whole foreskin was induced, and ultimately ulceration took place over the growth on the glans, by which the latter was brought into view; this event occurred about three weeks before admission. During the last week or two the pain and soreness had been considerable, but up to that time he had lived as usual, and repeatedly exposed himself to the risk of venereal contagion.

Here, then, a most important question of diagnosis arose, viz., was the disease cancerous or syphilitic? The age of the patient, the entire absence of cachexia, the short time which the disease had lasted, the acutely inflamed and almost sloughing condition of the parts, and the fact that, whilst both glans and prepuce were equally implicated, they had not adhered together, all seemed opposed to the idea of its being malignant. On the other hand, not a single symptom of constitutional syphilis could be detected, and the character of the firm sprouting granulations was such as is very rarely met with in the latter disease, in which warts, when present, are commonly seated on a sound surface. and seldom or never co-exist with acute ulceration.

The congenital phymosis, whilst notoriously favourable to the growth of cancer, might also, from its allowing of the retention of irritating secretions, serve to render a venereal sore much more virulent than usual. Previous to admission, he had been treated for syphilis, and neither himself nor his surgeon had suspected that the disease had any other character.

A consultation was held, in which Messrs. Stanley, Lloyd, and Paget took part. It was decided to lay the diseased parts freely open, as they were evidently suffering much from inflammatory tension. On splitting up the prepuce, its lining and the greater part of the corona glandis were found to be extensively ulcerated, and covered with the sprouting,

wart-like granulations before mentioned. A slice of the prepuce having been removed and subjected to microscopic examination, large quantities of common exudation corpuscles were found, and only two or three epithelium scales of suspicious character, being less angular, having more granular matter and less distinct nuclei than healthy ones. Still, there was not sufficient conclusively to decide the question; and, although the opinion of all who saw it was strongly in favour of the malignant nature of the disease, yet it was thought best to give the poor fellow the chance afforded by a trial of anti-syphilitic remedies before resorting to such a serious procedure as the amputation of the whole organ.

℞. Potassii iodidi gr. iij., decoct. sarzæ co. ℥i. ter die.

August 10. The inflammation has subsided, and the swelling is diminished; the ulceration has, on the contrary, extended, and is still more closely covered by the warty granulations; which are firmer and dryer than before. The folds of the prepuce lodge a fetid and ill-formed discharge. He does not suffer much pain, but a constant and very troublesome itching, which has obliged him to take morphia each night in order to procure sleep.

Mr. Paget again removed a small portion of prepuce, and examined it with the microscope. The appearances which had before been masked by the abundance of inflammatory products were now evident, and there remained no doubt as to its being a genuine epithelial cancer. Amputation of the penis was accordingly proposed to the patient, which he after some hesitation assented to.

15th. The skin of the penis having been drawn as much forwards as possible, and the organ being grasped firmly in the blunt blades of an instrument for the purpose, the whole was severed at a single sweep of the knife within an inch of the pubes. The skin at once retracted, leaving the uncovered corpora cavernosa projecting prominently forwards. A few ligatures were applied, and the part covered with a wet rag.

On examining the removed parts, the prepuce, glans, and corpora cavernosa, to within half an inch of the incision, were found to be infiltrated with the deposit of epithelial cancer. It is perhaps scarcely necessary to remark, that the object in dividing the skin as far back as possible was to prevent it, during the healing process, from closing over the end of the stump and occluding the orifice of the urethra. In amputation of an extremity, no result is more deprecated than a conical stump; in the case of the penis, however, that condition is most desirable. and the rules for the performance of the two operations are consequently reversed. The incision through the skin should, in the latter, be as far back as possible; while, as is well known, in the former it can scarcely be made too forward.

Sept. 5. The healing process has progressed favourably, and is now very nearly complete. The orifice of the urethra now projects, and its lips are everted and pouting in the best possible way. He has had no difficulty in voiding his urine, has been quite free frem pain and itching ever since the operation, and appears to be in good health.—Discharged.

This case furnishes another instance of the association of cancer of penis with congenital phymosis. Their very frequent concurrence has been noted by all who have recorded observations on the subject. Hey

observed it in nine out of twelve examples of the disease which fell under his notice—a proportion very great, indeed, when we consider that the malformation is, after all, not a common one. Mr. Travers has thrown additional light upon the subject by showing that Jews are very rarely indeed the subjects of cancer penis. Now, if it be remembered that the disease, when once begun, is almost necessarily fatal, and that, too, very rapidly; that the part is one in which operations are perhaps of less benefit in protracting its course than in most others; and that one of the most recent and trustworthy authors on the subject states that he can find "no recorded case of permanent recovery after amputation of the penis for unquestionable cancerous disease," we think it will be admitted, that as the disease is one which we cannot triumphantly cure, there would be nothing very unseemly in condescending to try means of prevention. The connexion between the malformation and the disease is so palpable, that were cancer penis as common as small-pox, no doubt but that, before this, some public provision would have been made for the circumcision of every elongated prepuce. Does, then, its rarity constitute any good reason why this simple precaution should be neglected? The operation is totally devoid of danger, and, if performed in infancy, is attended with but little inconvenience. If those engaged in the practice of obstetrics would undertake the matter, we feel sure that their trouble would meet a full reward, in the consciousness, that, however unable to recognise the exact instances, they were yet most certainly the means every now and then, of preserving a fellow-man from a disease attended with peculiar misery, and resulting in a very painful death.

We may illustrate the way in which the disease usually kills, by reference to a case recently under the care of Mr. Lawrence. A man, aged 61, the subject of congenital phymosis, was attacked in 1847 with cancer of the glands. In July, 1851, amputation of the part was performed; and in March, 1852, after great suffering, he died with a return of the disease in the glands of the thigh and groin. His case furnished no exception to the general rule, that the progress of malignant diseases is slow in proportion to the age of the patient.

The importance and occasional difficulty of diagnosing between cancerous and venereal ulceration of the genitals will be generally admitted. The presence in the former, of firm sprouting cauliflower-like excrescences, is undoubtedly a most valuable sign; but the use of the microscope should never be omitted in doubtful cases. By its assistance, the conclusion was arrived at in the one just related, and there is another at present under treatment in the hospital, and which for that reason we shall not now give in detail, in which its evidence was equally important. A woman, aged 39, was admitted into the Foul Ward, on account of a painful superficial ulcer, of a horse-shoe shape, extending across the pubes and down each labium, and attended by a large bunch of warts on the inner side of the left thigh. The disease appeared to have been preceded by a sharp gonorrhœa; and for some weeks no doubt was entertained as to its venereal character. The growth of firm warty granulations around the edge of the sore, however, excited suspicions, and, a portion having been removed for microscopic examination, an epithelial structure was easily recognised. It was then observed, that over the

surface of the sore and the surrounding warts the hairs of the part still grew in a natural manner. Whether any importance could be attached to this circumstance as a point of diagnosis we are not prepared to say: but such a state is certainly not common on syphilitic ulcerations, however superficial.—*Med. Times and Gazette, Oct.* 23, 1852, *p.* 414.

156.—ON THE MEDICAL TREATMENT OF INSANITY.

By Dr. Forbes Winslow.

[The following is a brief outline of Dr. Winslow's views on the pathology and medical treatment of insanity:]

It is necessary that we should, before being able to appreciate the effect of medical treatment, entertain just and enlightened views as to the *curability of insanity.* I now speak from a somewhat enlarged experience, from much consideration of the matter, and I have no hesitation in affirming that, if brought within the sphere of medical treatment in the earlier stages, or even within a few months of the attack, insanity, unless the result of severe physical injury to the head, or connected with a peculiar conformation of chest and cranium, and an hereditary diathesis, *is as easily curable as any other form of bodily disease for the treatment of which we apply the resources of our art.* It is a lamentable error to suppose, and a dangerous, a false, and unhappy doctrine to promulgate, that the disordered affections of the mind are not amenable to the recognised principles of medical science. I again declare it to be my positive and deliberately formed opinion, that there are few diseases of equal magnitude so susceptible of successful medical treatment in the incipient form as those implicating the normal action of thought. The vast amount of incurable cases of insanity which crowd the wards of our national and private asylums, is pregnant with important truths. In the history of these unhappy persons—these lost and ruined minds—we read recorded the sad, melancholy, and lamentable results of either a total neglect of all efficient curative treatment at a period when it might have arrested the onward advance of the cerebral mischief, and maintained reason upon her seat; or of the use of injudicious and unjustifiable measures under mistaken notions of the nature and pathology of the disease. In no class of affections is it so imperatively necessary to inculcate the importance of early and prompt treatment, as in the disorders of the brain affecting the manifestations of the mind. I do not maintain that our curative agents are of no avail when the disease has passed beyond what is designated the "curable stage." My experience irresistibly leads to the conclusion that we have often in our power the means of curing insanity, even after it has been of some years' duration, if we obtain a thorough appreciation of the physical and mental aspects of the case, and perseveringly and continuously apply remedial measures for its removal; but I cannot dwell too strongly upon the vital necessity of the early and prompt exhibition of curative means in the incipient stage of mental derangement.

I believe insanity (I am now referring to persistent insanity, not those transient and evanescent forms of disturbed mind occasionally witnessed) to be the result of a *specific morbid action of the hemispherical ganglia, ranging from irritation, passive and active congestion, up to positive and unmistakable inflammatory action.* This state of the brain may be confined to one or two of the six layers composing the hemispherical ganglia; but all the layers are generally more or less implicated, in conjunction with the tubular fibres passing from the hemispheres through the vesicular neurine. This specific inflammation, from its incipient to the more advanced stage, is often associated with great vital and nervous depression. It is, like analogous inflammation of other structures, not often accompanied by much constitutional or febrile disturbance, unless it loses its specific features, and approximates in its character to the inflammation of active cerebritis or meningitis. This state of the hemispherical ganglia is frequently conjoined with active sanguineous circulation and congestion, both of the substance of the brain and its investing membranes. The morbid cerebral pathological phenomena—viz., the opacity of the arachnoid, the thickening of the dura mater, its adhesions to the cranium, the depositions so often observed upon the convoluted surface of the hemispheres, and on the meninges, the hypertrophy, scirrhus, the cancerous affections, the induration, the depositions of bony matter in the cerebral vessels and on the dura mater, the serous fluids in and the ulcerations upon the surface of the ventricles, the alterations in the size, consistence, colour, and chemical composition of the vesicular neurine and fibrous portion of the brain—are all, in my opinion, the results, the sequelæ, more or less, of that specific inflammatory condition of the hemispherical ganglia to which I have referred. It does not necessarily follow that the *fons et origo mali* of insanity is invariably to be traced to the brain. The preliminary morbid action and irritation are often situated in the heart, the stomach, the liver, the bowels, the lungs, or the kidneys, the brain being secondarily affected; nevertheless, in all cases inducing actual insanity, the hemispherical ganglia are involved in the morbid action. The most recent pathological doctrine propounded to explain the phenomena of insanity—I refer to the views of a recent writer—that derangement of mind is the effect of "*loss of nervous tone,*" and that this loss of nervous tone is "*caused by a premature and abnormal exhaustibility of the vital powers of the sensorium*"—conveys to my mind no clear, definite, or precise pathological idea. It is true that we often have, in these affections of the brain and disorders of the mind, "loss of nervous tone," and "exhaustion of vital power;" but, to my conception, these are but the *effects* of *a prior morbid condition of the encephalon,* the *sequelæ* of specific inflammation of the hemispherical ganglia. To argue that humanity is invariably and exclusively the result of "loss of nervous tone," is to confound cause and effect, the *post hoc* with the *propter hoc;* and would, as regards therapeutical measures, act as an *ignis fatuus,* alluring us as pathologists from the right and legitimate path. I feel anxious that my views upon this important subject should be clearly enunciated, and not open to misconception. I think much mischief has arisen from a belief in the existence of active ordinary cerebral inflammation in cases of insanity, for it has led to the adoption

of treatment most destructive to life, and has seriously interfered with the permanent restoration of the reasoning powers. Nevertheless, insanity is occasionally complicated with acute cerebral symptoms sufficient to justify us in the cautious use of somewhat active measures for its removal. We must avoid the fatal error of a too rapid process of generalization, and be careful of not looking to symptoms instead of to the disease itself, and of permitting ingenious and well-constructed *à priori* theories of the nature of insanity to dazzle our imaginations and abstract the mind from the steady and patient investigation of pathological science and individual cases of disease. If we allow our judgment to be warped by the inflammatory theory on the one side, (I am now speaking of *ordinary*, not of *specific* inflammation), and conclude that the excitement of mania is to be subdued by copious depletion or the administration of antiphlogistic measures,—or if, on the other hand, we adopt the speculative opinions of those who believe that in every case of insanity, irrespectively of its origin, its progress, or its character, there exists "mere loss of nervous tone," caused by "a premature abnormal exhaustibility of the vital powers of the sensorium,"—how lamentably shall we be misled as to the real character of insanity, and in the application of our therapeutic agents? These circumscribed and partial views of the pathology of insanity, often, alas! lead to serious solecisms in practice. In ninety per cent. of the cases of acute mania there is found in the brain and its meninges a state of sanguineous congestion, particularly of the hemispherical ganglia, combined with alterations in the grey nervous matter. In forming an opinion of the actual pathological condition of the cerebral substance, we should remember that, particularly in public asylums, it is a rare occurrence for recent cases to be admitted; that the acute and sub-acute active cerebral conditions have subsided, and the disease has assumed a chronic form, before the patient is examined and placed under treatment; consequently many deductions recorded by pathologists have been based upon the study of chronic, and not of acute mania. A large per-centage of the cases, before admission into our national asylums, have passed through the primary and acute stages, and have probably been subjected to medical treatment. This fact must never be lost sight of in forming our opinion, not only of the nature of the disease itself, but of the medical treatment necessary for its cure. In private practice the acute forms of insanity are often met with; but even with the advantages which the physician can command, of investigating the earlier stages of deranged mind, he often discovers that the mental affection has been allowed to exist and slowly progress for a considerable period, no treatment, either medical or moral, having been adopted for its removal. In the incipient form of insanity, particularly when it manifests itself in plethoric constitutions, has been sudden in its development, is the result of physical causes, and is connected with the retrocession of gout, or is rheumatic in its character, there can be no doubt the nature of the changes induced in the brain is more allied to that of inflammation than that of nervous exhaustion. The attacks from the slow and insidious operation of moral causes are less likely to be accompanied by active symptoms. In many instances the maniacal ex-

citement is *asthenic* or *atonic* in its character, resembling the delirium of the last stages of typhus fever.

The most simple classification of insanity, the one best adapted for useful and practical purposes, is its division into the *acute* and *chronic* forms; the insanity ushered in by *excitement* or by *depression* into *mania* and *melancholia*—*amentia* and *dementia*. The minute divisions and subdivisions, the complicated and confused classification to be found in books, may serve the ostentatious purposes of those desirous of making a pompous display of scientific lore, but I think they have tended to bewilder and obscure the understanding of the student, and lead the man in search of practical truth from the investigation of the disease itself to the mere study of its symptoms, and to the consideration of unessential points and shades of difference. Adhering to this division of the subject, each form should be viewed in relation to its *complications*, as well as to its *associated diseases*. Among the former are epilepsy, suicide, homicide, paraplegia, hemiplegia, and general paralysis. The associated diseases implicate the lungs, heart, liver, stomach, bowels, kidney, bladder, and skin.

Before speaking of the preliminary examination of the patient supposed to be insane, and the prognosis in cases of insanity, I would premise that those inexperienced in the examination of this class of case would often arrive at false and inaccurate conclusions, if they were not cognisant of the fact, that the insane often describe sensations which they have never experienced, and call attention to important symptoms which have no existence except in their own morbid imaginations. A patient will tell you that he has a racking headache, or great pain and tenderness in the epigastric region, both symptoms being the fanciful creations of his diseased mind. This is particularly the case in the hysterical forms of insanity, in which there always exists a disposition to pervert the truth, and exaggerate the symptoms. Again, serious bodily disease may be present, the patient not being sufficiently conscious to comprehend the nature of the questions asked, or able to give intelligible replies to the anxious interrogatories of the physician. Insanity often masks, effectually obscures, other organic affections, the greater malady overpowering the lesser disease. When Lear, Kent, and the Fool, are standing alone upon the wild heath, exposed to the merciless pelting of the tempest, Kent feelingly implores the king to seek shelter from the "tyranny of the open night," in an adjoining hovel; it is then that Lear gives expression to the psychological truth just referred to—

> "Thou think'st 'tis much that this contentious storm
> Invades us to the skin: so 'tis to thee;
> But *where the greater malady is fixed,*
> *The lesser is scarce felt;*
> * * * * The tempest *in my mind*
> Doth from my senses take *all feeling else*
> *Save what beats there.*"

Disease of the brain may destroy all apparent consciousness of pain, and keep in abeyance the outward and appreciable manifestations of other important indications of organic mischief. Extensive disease of the sto-

mach, lungs, kidneys, bowels, uterus, and heart, have been known to have progressed to a fearful extent without any obvious recognisable indication of the existence of such affections. Insanity appears occasionally to modify the physiognomy and symptomatology of ordinary diseases, and to give them peculiar and special characteristic features.

Again, it is necessary for the physician to watch the operation of medicine in masking important diseases. The different forms of narcotics, if given in heroic doses, often mislead us in our estimate of the nature of bodily diseases not directly connected with the mental affection. The most essential preliminary matters of inquiry have relation to the age, temperament, previous occupation, and condition in life of the patient. It will be necessary to ascertain the character and duration of the attack; to ascertain whether it has resulted from moral or physical causes; if of sudden, insidious, or of slow growth; whether it has an hereditary origin, or is the effect of a mental shock, or of mechanical injury; whether it is the first attack, and if not, in what features it differs from previous paroxysms. It will also be our duty to inquire whether it is complicated with epilepsy, paraplegia, or hemiplegia, suicidal or homicidal impulses. If any prior treatment has been adopted, we must ascertain its nature; whether the patient has suffered from gout, heart disease, rheumatism, cutaneous affection, or syphilis. It is important in cases of females to obtain accurate information in relation to the condition of the uterine functions, and to ascertain the state of the moral affections. We should also inquire whether the patient has been suspected of habits of self-abuse. Having obtained accurate information upon these essential points, our own personal observation will aid us in ascertaining the character of the mental disturbance; the configuration of the head, chest, and abdomen; the gait of the patient, the degree of sensibility and volitional power manifested; the state of retina, the pulse, the urine, and temperature of the scalp and body generally; the condition of the skin and chylopoietic viscera; the action of the heart, lungs, and nature of any existing disease of the uterus. If a patient complains of any local mischief, however imaginary it may appear to be at the time, it is essentially necessary that we should clearly satisfy our minds upon the point, before dismissing it as not entitled to serious investigation. A patient once bitterly complained of retention of urine; upon examination the bladder was found to be distended, and the man had passed no urine for twenty-four hours. I was about to introduce a catheter, when the patient burst into a fit of laughter, and immediately emptied his bladder. Esquirol relates a case of a merchant, who, whilst suffering from melancholia, declared that some foreign body was sticking in his throat. No notice was taken of this supposed fanciful idea. The patient died, and an ulcer was discovered at the upper third of the œsophagus. A patient complained of devils being in his stomach and bowels, and declared that they were acted upon by electric, magnetic agencies. After death he was found to have scirrhus of the stomach, and chronic inflammation of the bowels. A patient refused to eat; he said he could not swallow his food without great pain. As he had exhibited other symptoms of a disposition to suicide, it was thought by myself and others, that his obstinate refusal of food was associated with ideas of self-destruction.

He died, and at the post-mortem examination a stricture in the pylorus was discovered. These illustrations, and they could easily be extended, will prove the importance of paying minute attention to particular delusions, with the view of ascertaining whether they have not a particular and *actual* physical origin.

The *prognosis* in cases of insanity will mainly depend upon the duration of the attack, its character and origin, and the diathesis of the patient. The prognosis is generally unfavourable if the disease is hereditary—if the symptoms are similar in character to those exhibited by other members of the family when insane. Insanity, accompanied by acute excitement, is, *cæteris paribus*, more easy of cure than when it has been of slow and gradual growth, and is marked by great mental depression. The prognosis is favourable in cases of puerperal mania; it is unfavourable when there exists a want of symmetry between the two sides of the head, with small anterior, and large posterior cerebral development. Any great inequality in the cranial conformation would be a suspicious indication. The existence of any malformation in the development of the chest is also an unfavourable sign, and would induce us to give a guarded prognosis. Dr. Darwin says, when a person becomes insane, who has a small family of children to absorb his attention, his prospect of recovery is but small, as it establishes that the maniacal hallucination is more powerful than those ideas which usually interest us most. The prognosis is unfavourable when patients are under the morbid delusion that they are poisoned, and are constantly suffering internally from peculiar sensations. Religious delusions are more difficult to eradicate than other morbid impressions. The age of the patient will materially guide us in forming a correct prognosis. Hippocrates says the insane are not curable after the fortieth year; Esquirol maintains the greater portion recover between the ages of twenty and thirty; Haslam between the ages of ten and twenty. As a principle, we may conclude that the probability of recovery in any given case is in proportion to the early age, physical condition, and duration of the attack. When a patient has youth and a good constitution to aid him, and is advantageously placed, having at command remedial measures, and is excluded from all irritating circumstances, the prognosis may be favourable. I have seen patients after the advanced age of sixty and seventy recover; and cases of cure are upon record where insanity has existed for ten, fifteen, and twenty years. In forming our prognosis, it is important to ascertain the educational training of the patient. Has he been in the habit of exercising great self-control? Has his mind been well disciplined? Has he kept in abeyance the passions, or have the motions and impulses of his nature obtained the mastery over him? He who has been taught to practise self-denial and self-control in early life is, *cæteris paribus*, in a more favourable position for recovery than he who has permitted himself to be the willing and obedient slave of every passion and caprice. Insanity, accompanied with criminal propensities, is said to be incurable, because, as Ideler urges, such patients "cannot bear the torments of their consciences, and relapse into the stupefaction of insanity to flee from the consciousness of their guilt." The prognosis is unfavourable when the insanity is complicated with organic disease of

the heart and lungs, with deafness, and paralysis in any of its forms. Lesions of the motor power are very unfavourable indications. Great impairment of mind, accompanied with delusions of an exalted character, and associated with paralysis, is generally incurable. Esquirol says, epilepsy, if associated with insanity, places the patient beyond all prospect of cure. I should be loath to adopt this sweeping condemnation. I have seen cases of epilepsy, combined with mental derangement, recover; although, I admit, they constitute a difficult class of case to manage.—*Lancet, Oct.* 8, 1852, *p.* 321.

[As it would be impossible to describe in detail the particular class of remedial agents adapted to each class of deranged minds, in the succeeding lecture the subject has been generalized,—the most prominent kinds of insanity, and the difficulties of their management, only being discussed.]

In regard to the treatment of acute mania, the important and much-litigated question at issue among practitioners of all countries, is that relating to the propriety of depletion. Need I direct your attention to the conflicting and contradictory opinions entertained by eminent writers on this important and much-vexed therapeutical point? Whilst some practitioners of great repute and enlarged experience fearlessly recommend copious general depletion for the treatment of insanity, and refer to cases in which this practice has been attended with the happiest results, others, equally eminent, and as much entitled to our respect, denounce the lancet as a most fatally dangerous weapon, and shudder at the suggestion of abstracting, even locally, the smallest quantity of blood. In avoiding Scylla, we must be cautious of being impelled into Charybdis. The error consists in a vain effort to discover a uniform rule of treatment, and attempting to propound some specific mode of procedure adapted to all cases. He who maintains that blood-letting is never to be adopted in the treatment of mania, without reference to its character, its origin, the peculiar constitution of the patient, and the existence of local physical morbid conditions, which may be materially modifying the disease, and giving active development to delusive impressions, is not a safe practitioner. Neither would I confide in the judgment of the physician who would, in every case of violent maniacal excitement, attempt to tranquillize the patient by either general or local depletion.

In attacks of insanity, when the symptoms are acute, the patients young and plethoric, the habitual secretions suppressed, the head hot and painful, the eyes intolerant of light, the conjunctivæ injected, the pupils contracted, the pulse rapid and hard, and the paroxysm sudden in its development, *one* general bleeding will often arrest the progress of the cerebral mischief, greatly facilitate the application of other remedies, and ultimately promote recovery. In proportion as the symptoms of ordinary insanity approach those of phrenitis, shall we be justified in the use of general depletion. Although it is only occasionally, in instances presenting peculiar characteristic features—cases occurring in the higher ranks of life, where the patient has been in the habit of living *above par*, and is of a sanguineous temperament—that we are justified in having recourse to the lancet, there is a large class of recent cases presenting

themselves in the asylums for the insane, both public and private, in the treatment of which we should be guilty of culpable and cruel negligence, if we were to omit to relieve the cerebral symptoms by means of the local abstraction of blood. It is, alas! the fashion and caprice of the day to recklessly decry the application of cupping-glasses or of leeches in the treatment of insanity, in consequence, I think, of the slavish deference shown to the opinions of a few French pathologists of eminence, who have, by their indiscriminate denunciation of *all depletion*, frightened us into submission, and compelled us to do violence to our own judgment. The local abstraction of blood is, in the hands of the discreet and judicious practitioner, a powerful curative agent; and yet it is the practice of some men, and men, too, of position, to discard altogether the remedy.

I will briefly refer to the kind of case in which the local abstraction of blood will be found most beneficial, if proper regard be had to the temperament, constitutional condition, and the local circumstances modifying the character of the attack. In insanity, when the exacerbations occur at the menstrual period, *cæteris paribus*, leeches to the vulva and thighs, with the use of the foot-bath, and the exhibition of aloetic purgatives, will be attended by the most favourable results. In irregular and obstructed menstruation, the local abstraction of blood will be very serviceable. In suppressed hemorrhoids, leeches to the neighbourhood of the sphincter ani will greatly benefit in unloading the hemorrhoidal vessels, and relieve the brain of undue excitement. In cases of nymphomania, leeches to the vulva are indicated, and have been known to greatly benefit. In cases of intermittent insanity, the paroxysm may often be cut short by relieving the overloaded state of the vessels of the head by means of cupping or the application of leeches. In some instances, I have tried Dr. Wigan's plan, and have applied leeches to the Schneiderian membrane, particularly for the treatment of insanity of early life, and connected with conduct evidently the effect of cerebral irritation. I have seen this mode of procedure of essential benefit in persons of plethoric constitution and of sanguineous temperament. Occasionally the insanity is found to be associated with active visceral disease, or with hypertrophy and other affections of the heart. Under these circumstances, when there exists great tenderness over the region of any of the visceral organs, and we are satisfied, by a careful stethoscopic examination, that hypertrophy of the heart is present, leeches applied over the seat of the local mischief, conjoined with other appropriate treatment, will materially aid us in subduing the maniacal affection. In cases of illusions of hearing, or of vision, it will often be necessary to apply leeches behind the ears, or over the superciliary ridges. I have known this practice entirely remove the morbid illusions which had been embittering the person's life.

But apart entirely from the local affections to which I have referred, for the treatment of idiopathic insanity, apparently without any complications, or modified by any of the associated diseases, the careful and temperate local abstraction of blood, when general depletion is inadmissible, will often materially shorten the duration of an attack of insanity, and restore the mind to a healthy condition. I am anxious to record my favourable opinion of this mode of treatment, because I have witnessed

so many sad results from an opposite timid and reprehensible neglect of the means placed within our power for the treatment of the varied forms and degrees of mental derangement. Sad consequences have undoubtedly followed the indiscriminate use of depletory measures; the presence of violent mental excitement has occasionally led the practitioner to the conclusion that the disease was of an active character; and in the attempt to allay the undue cerebral excitement by means of antiphlogistic measures, the patient has sunk into incurable and hopeless dementia. But recognising an *anæmic* class of cases, where great excitement is often associated with loss of nervous and vital power, we must be cautious in permitting serious disease to be creeping stealthily on in the brain, no effort being made to relieve the congested cerebral vessels or inflamed tissue, until serious disorganization has taken place in the delicate structure of the vesicular matter, and the patient is for ever lost. In the treatment of acute mania, the remedy next in importance to cautious depletion is that of *prolonged hot baths*. To Dr. Brierre de Boismont, of Paris, at whose excellent institution I first witnessed the application of this remedial agent, the profession is indebted for reviving a practice which had long fallen into disrepute. In treatment of acute mania, the prolonged hot baths will be found of the most essential service. Dr. Brierre de Boismont has recorded the history of sixty-one of seventy-two cases that were subjected to this mode of treatment. Three-fourths of this number were cured in a week, and the remainder in a fortnight. The patients remain from eight to ten and fifteen hours in warm baths, whilst a current of cold water is continually poured over the head; the temperature of these baths is from 82° to 86° Fahr.; the affusions 60° Fahr. Among the therapeutic effects of these baths, Dr. B. de Boismont reckons a diminution of the circulation and respiration, relaxation of the skin, alleviation of thirst, the introduction of a considerable quantity of water into the economy, an abundant discharge of limpid urine, a tendency to sleep, a state of repose. This mode of treatment is said to be ineffectual in cases of periodic intermittent mania, in mania beginning with great mental impairment, or associated with epilepsy or general paralysis. The result of my own experience of this plan of treatment has produced a very favourable impression upon my mind, and I think it is entitled to a fair trial in all our public asylums where they admit acute and recent cases.

In some forms of acute mania it is desirable, as a substitute for depletion, to diminish the activity of the circulation by the exhibition of nauseating doses of the tartrate of antimony; it may be serviceably combined with the tinctures of digitalis and hyoscyamus. This remedy, however, requires careful watching, as it often has been known to suddenly reduce the vital powers to a low ebb, and extinguish life. It will be found beneficial in proportion to the recent character of the case, and the positive activity of the cerebral circulation. The tincture of digitalis was formerly in great repute as an anti-maniacal remedy; the experience of late years has not encouraged us in administering it in the doses prescribed by some of the old writers; nevertheless, it is a useful agent, and occasionally proves a valuable auxiliary in the hand of the practitioner who carefully watches its operation.

For the cure of the acute forms of insanity the douche bath has been much lauded; but this remedy is now rarely used in British asylums. I have occasionally seen benefit derived from its exhibition, but it requires great caution in its use. A patient has been subjected, whilst in a paroxysm of acute delirium, to the douche bath, and has sunk almost immediately into incurable idiocy! The physical shock has occasionally been known to produce a good moral impression. For illustration: a patient imagined himself emperor of the world, and would not allow any one to address him by any other title. The immediate application of the douche bath destroyed his idea of royal dignity, and he was willing to admit that he had never been, nor was at any time a regal personage. A few hours subsequently the delusive impression returned in all its original force; the douche bath was again had recourse to, and a second time the morbid impression vanished; by a series of baths he was restored to sanity, and after his complete recovery, when the particulars of his case were placed before him, he observed, "Why did you not whip me, and beat this nonsense out of my head? I wonder how you could have borne with my folly, or I have been guilty of such contemptible arrogance and obstinacy." As a substitute for the douche, the shower bath is often used with great benefit, particularly in certain forms of melancholia, associated with nervous depression and general debility. In cases of melancholia, or other kinds of chronic insanity connected with a congested state of the liver, the nitro-muriatic bath will occasionally do much good. In a few instances I have noticed marked benefit from Bertolini's sedative bath, composed of henbane two pounds, and equal parts of hemlock, and cherry laurel leaves, well infused in a sufficient quantity of hot water. But the simple hot bath in certain conditions of the nervous system, particularly in some forms of suicidal mania, is of the utmost benefit. A warm bath a short period before retiring to rest, bathing the head at the same time with cold water, particularly if the scalp be unnaturally hot, will often ensure a quiet and composed night when no description of sedative, however potent its character and dose, would influence the system.

In the early stage of insanity, and throughout its whole course, the bowels are often in an obstinately constipated condition. The concentration of nervous energy in the brain appears to interfere with that supply which should proceed to other structures; consequently there appear to be a want of healthy sensibility in the mucous membrane of the bowels, and an interruption to the peristaltic action of the intestinal canal. There is no class of agents which act so certainly and effectually in relieving the mind when under the influence of depressing emotion, as cathartics. The ancients considered hellebore as a specific in certain forms of melancholia. In the hands of modern practitioners it has not been found to merit the high encomiums which have been passed upon it. It is important in every case of insanity, but particularly in the acute stages of mental derangement, to act powerfully upon the bowels by means of a succession of brisk cathartics. The bowels are often found gorged with fæcal matter, and immediate relief often follows the administration of two or three doses of calomel and colocynth, or of croton-oil. It will often be necessary to assist the operation of the cathartics by

means of enemata. In hysterical and some other forms of insanity there is always a disposition on the part of the patient resolutely to resist the calls of nature, and, knowing this peculiarity, we must carefully watch the condition of the bowels, otherwise serious mechanical obstructions may ensue, followed by intractable diseases of the rectum. Insanity is often associated with gastric and intestinal disease, with an irritable condition of the mucous membrane of the alimentary canal; and, in such cases, although it is important to relieve the bowels and prevent them from being constipated, we must bear in mind that the injudicious exhibition of irritating drastic cathartics may aggravate the mental disease, by increasing the gastric and intestinal irritation, and thus do permanent and irremediable mischief. Much injury may arise from the indiscriminate and injudicious administration of cathartics. In insanity associated with menstrual obstructions, it will be necessary to exhibit the class of purgatives known to act specifically upon the lower bowel; consequently aloetic cathartics, such as the compound decoction of aloes, are found of most service in these cases. In plethoric habits, when there is a marked determination of blood to the head, no medicine will relieve so speedily as active doses of the compound powder of jalap.

In the treatment of insanity, the class of medicines termed *sedative* play an important part. If exhibited with judgment, the most gratifying results often follow *their continuous and persevering administration.* The sedative treatment of insanity is a subject of itself, and I quite despair of touching even upon the confines of the many interesting and important points involved in the consideration of this division of my lecture. In insanity unassociated with active cerebral circulation, congestion, or paralysis, or after the head symptoms have been relieved by the local abstraction of blood and the administration of appropriate medicine, the exhibition of sedatives will be followed by the most beneficial results. In recent cases they are generally inadmissible, except in delirium tremens and puerperal insanity, and other forms of derangement analogous in their pathological character and symptoms to these affections. In chronic insanity, in melancholia unconnected with abdominal repletion, or visceral disease, the persevering use of sedatives in various combinations will often re-establish sanity, when no other course of treatment is likely to be successful in dispelling the illusive impressions, or raising the drooping and desponding spirits. Battley's solution, the tincture of opium, the meconite, acetate, and hydrochlorate of morphia, the preparations of hyoscyamus, conium, stramonium, camphor, hops, aconite, ether, chloroform, hydrocyanic acid, Indian hemp, are all of great and essential service if administered with judgment and sagacity. In suicidal insanity, when local cerebral congestion is absent, and the general health and secretions are in good condition, the meconite and hydrochlorate of morphia often act like a charm, if *uninterruptedly and perseveringly given* until the nervous system is completely under its influence. I have witnessed the most distressing attacks of suicidal mania yield to this treatment, when every other system has failed. I could cite the particulars of numerous cases of this form of insanity radically cured by the occasional local abstraction of blood from the head, the administration of alteratives, the warm bath, and sedatives.

In the use of this powerful curative agent, our success will often depend upon a *ready adaptation of the kind of sedative to the description of case in which it may be deemed admissible, and a judicious combination of various kinds of sedatives.* I do not think we pay sufficient attention to such combinations. I have often seen an apparently incurable and unmanageable case yield to several kinds of sedatives combined, when it resisted the operation of any one or two. The extract of conium is often of service in cases of insanity combined with epilepsy; conjoined with mineral tonics, conium is occasionally of benefit, particularly in melancholia connected with chronic disease of the digestive organs and with neuralgia. In cases of uterine irritation, I have seen great good result from the combination of hops, camphor, and hyoscyamus. In illusions of vision, belladonna, commencing with quarter-grain doses, will be found a useful remedy. In insanity complicated with dysmenorrhœa, the combination of camphor with hyoscyamus, opium, or conium, may be given with great advantage. The hydrochlorate of morphia, in union with dilute hydrochloric acid, is said to be useful in cases where the sedative treatment is desirable. I am often in the habit of exhibiting sedatives and tonics in a state of combination, particularly conium with iron, opium with quinine, or with the infusion or compound decoction of cinchona. In debility, with irritability of the nervous system, accompanied by restlessness, Battley's solution, with the preparations of cinchona, will often prove of great benefit. The tincture of sumbul I have occasionally administered, and I think with advantage, in paroxysmal or convulsive forms of insanity. I have given to the extent of one to two drachms for a dose. In hysterical derangement, the tincture of Indian hemp will occasionally allay the excitement, and produce sleep more rapidly than any other form of sedative. The valerianate of zinc has not answered the expectations of those who have spoken so highly of its medicinal virtues. Tincture of opium with camphor, and the tartrate of antimony, is an excellent combination in cases of doubtful cerebral congestion. Tincture of hops in doses of from one to four drachms, it will be necessary to give when no other formulæ are admissible. As a mild form of sedative, compound ipecacuanha powder is occasionally recommended; but a good substitute for Dover's powder is a pill composed of opium, ipecacuanha, and soap.

In treating the more chronic forms of insanity, particularly melancholia, it will be essential to bear in mind that they are difficult of cure, because, owing to the slow, obscure and insidious character of the disease, the mental affection has been of some duration before the attention of the practitioner has been directed to its existence. As this form of derangement generally exhibits itself in trifling perversions of the affections and propensities, leading to little acts of extravagance and irregularity of conduct, associated with great depression, we often find the attack has existed some years before a necessity is felt for any medical advice or treatment—perhaps a suicidal propensity has manifested itself, this being the first apparent overt act of the insanity.

It is necessary, before suggesting any course of treatment in melancholia, to ascertain whether any latent visceral disease be present. Occasionally the local irritation will be found either in the liver, the

stomach and bowels, and in women the uterine functions are frequently disordered. In the religious and other forms of melancholia in females, the delusive ideas are often associated with uterine irritation; and under such circumstances, if actual physical derangement of an active character exists in this organ, the best treatment will be, the application of leeches to the neighbourhood of the uterus, combined with warm hip-baths, sedatives, and mineral tonics. In cases of melancholia, the digestive functions are often much vitiated, the circulation languid, the skin cold and flaccid, and these symptoms being conjoined with a general loss of physical tone. Such patients require generous diet, good air, gentle exercise, and occasional stimuli. When dyspeptic symptoms are combined with an inactive state of the bowels, I have often administered the compound tincture of guaiacum with great benefit. It is important to watch the particular features in these cases, and to improve the general health by the exhibition of mild alteratives and vegetable tonics, with alkalies. I have occasionally administered, with success, in this form of insanity, apparently associated with an abnormal condition of the nutrition of the brain, cod-liver oil, with preparations of iron.

My time will not admit of my submitting for your approval the treatment best adapted for those forms of mental disease associated with an atrophied or softened condition of the nervous matter. I think more is to be done for the cure of these cases than the writings of medical men would lead the student to suppose, particularly if the disease be seen and subjected to treatment in the early stages. I have recorded the details of several instances of cerebral disease, exhibiting all the legitimate features of ramollissement, and yielding to the persevering administration of the preparations of iron, phosphorus, zinc, and strychnia, combined with generous living, and the occasional application of a leech behind the ear, should indications of cerebral congestion be present. I have also derived benefit in these cases from the use of the milder forms of mercurials, associated with cinchona. In cases of impairment of the mind, loss of memory, defective power of attention, occasional paroxysms of *mental* paralysis, unconnected with lesions of the *motor* power, I have found a solution of the acetate of strychnine, and a solution of the phosphate of strychnine, of great advantage.

In some chronic forms of insanity, in dementia, and persistent monomania, connected, as it was supposed, with morbid thickening of the dura mater, and with interstitial infiltration of the membranes, as well as with exudations upon its surface, I have occasionally had the head shaved, and have perseveringly rubbed over the scalp a strong ointment of the iodide of potassium combined with strychnine. In other instances I have kept the head painted with the mixture of iodine. I have seen marked benefit from this mode of treatment. In several cases where the mental symptoms were supposed to be associated with effusions of serum, I have ordered the iodine to be applied externally, at the same time exhibiting minute doses of calomel, or mercury-with-chalk, to slightly affect the system: this, conjoined with occasional tonics, diuretics, and stimuli to support the vital powers and enable the patient to undergo this treatment, is occasionally productive of considerable benefit,

in cases apparently placed quite beyond the reach of improvement or cure.

I have only briefly spoken of two distressing and often unmanageable forms of insanity—viz., of suicidal mania, and of those cases where the patient obstinately refuses to take either food or medicine. In insanity associated with suicidal tendencies, it will be important to ascertain whether any cerebral congestion exist, as such is often the case. A few leeches applied to the head, followed by an active cathartic, will relieve the local irritation, and often dissipate the idea of self-destruction. In the absence of any positive active cerebral symptoms, the prolonged hot bath, and the persevering exhibition of some form of sedative, is the best treatment to be adopted. I have seen the suicidal impulse removed after the administration of a few doses of belladonna; but the meconite and hydrochlorate of morphia, if given for a sufficient length of time, will, in the great majority of cases, distinct from actual incurable visceral or cerebral disease, effect a cure. Occasionally the shower-bath, and counter-irritation in the vicinity of the head, will aid us in re-establishing health. Cases sometimes present themselves where the patient determinately refuses to take either food or medicine. This character of case gives those who have the care of the insane much anxiety. The refusal of food may be connected with the determination to destroy life, or it may be associated with delusive impressions. I am inclined to believe that in the majority of these cases the symptom is the result of some local mischief remote from the brain, and sympathetically affecting the organ of thought. Upon examination we often find, in these cases, great gastric derangement, obstinate constipation, considerable tenderness upon pressure in the epigastric region, hepatic disease, the tongue foul, breath offensive, and other symptoms of derangement of the chylopoietic viscera. The determination to resist nourishment arises, under such circumstances, from a *positive loathing of food—a want of all inclination for it.* I have seen cases of this description, where it has been deemed necessary, in order to prolong life, to introduce food forcibly into the stomach, speedily cured by the adoption of means for improving the state of the general health and digestive organs. Mild alteratives, vegetable tonics, blisters over the region of the stomach, if the patient complain of pain in that region upon pressure, the warm and shower-bath,—is the most successful treatment to adopt in cases connected with obvious visceral derangement. Instances sometimes occur, where the refusal of food is clearly traceable to a delusive impression—an hallucination of taste, which makes everything appear to the patient bitter, disgusting, and poisonous. The unhappy patient imagines that he is commanded, either by good or evil spirits, not to eat. These unhappy persons must be treated upon general principles, and the remedies be adapted to the peculiar character of each individual case. Under such hallucinations of taste, patients often swallow the most extraordinary articles. The case of a lunatic is recorded, who imagined that his stomach required to be strengthened with iron. He was seized with inflammation of the œsophagus, of which he nearly died. He then confessed that he had swallowed the blade of a knife. After his death, there were found in his stomach seven oxidated lath nails, each two inches and a half long; thirty-

three nails, two inches long; forty-nine smaller iron nails and rivets; three pieces of wound-up iron wire; an iron screw, an inch long; a brass image of a saint; part of the blade of a knife; and other articles; amounting in number to 100, and weighing about twenty ounces. It will be necessary, in cases like those to which I have been referring, to ascertain whether the determination not to eat is the effect of such perversions or hallucinations of taste.

The time will only admit of my alluding generally to the importance, as a principle of treatment, of the administration of tonic remedies, active exercise in the open air, and to good and generous living. It is rarely necessary, in the treatment of insanity, to deprive the patient of animal food. Individual cases occasionally come under our notice, in which it is necessary, for a time, to enforce a farinaceous diet; but such is not often our duty. Among paupers, insanity is frequently cured by the free use of good animal food, and a generous supply of porter. Even when we are satisfied of the necessity of local depletion, it will often be necessary to give wine, and allow the patient a generous diet.

There are many other essential points in connexion with this important, this vast subject, which I am reluctantly compelled to pass entirely over. When I had resolved to bring this matter before the profession, I quite despaired, in the time allotted for one lecture, of being able to skim even upon the surface of the many deeply interesting points involved in the inquiry; but feeling—deeply, earnestly feeling—that, in relation to my own speciality, the subject of the medical treatment of insanity was of the first moment, of the most vital importance, to the profession as well as to the public, I did not hesitate in selecting this topic for one of my lectures, feeling assured that you would kindly make allowance for all imperfections, and generously appreciate the difficulties I had to encounter in concentrating in one short lecture a faint glimpse or shadow of a subject requiring for its successful exposition nine or ten lectures, equal in length to the one I have had the honour of reading this evening. I may have formed an extravagant and exaggerated conception of this subject, but I cannot close my eyes to the fatal consequences which have so often ensued from a belief in the incurability of insanity by medical means. In all grades of society, we witness the pernicious, the fatal, the disastrous effects of this dogma. We see it influencing the conduct of county magistrates in the architectural proportions, medical organization, and general arrangements of our great national asylums. We also perceive the consequences of the error operating in many of the private institutions for the treatment of the insane. Alas! are we not compelled to confess, that many of the asylums for the insane constitute mere places of detention—model prisons—and not what Government ought to insist upon making them—*hospitals for the cure of the insane,* under the government of medical officers, well trained, by preliminary education, for their important vocation, acquainted with the philosophy of the human mind, and fitted by the character of their *heart,* as well as by their *intellect,* for the right performance of the solemn and responsible duties entrusted to them by the public and the legislature?—*Lancet, Oct.* 16, 1852, *p.* 346.

157.—CASES OF ABSCESS OF THE ABDOMINAL PARIETES.

By Dr. John C. W. Lever.

(Reported by Messrs. Nason and Knaggs.)

[The first case was that of a female, aged 37, who was admitted April 16, 1851, and was delivered of her first child Dec. 24, 1850. After a tedious labour instruments were required to aid the delivery. Though no hemorrhage followed delivery immediately, yet a profuse discharge took place two days after, followed by a pale watery fluid. She is stated to have been unconscious for two days. After her recovery, great pain began to be felt around the pubic joint, with occasional throbbings. The symptoms gradually became aggravated, and heat and swelling were noticeable above the pubes. The following are the]

Symptoms on admission.—She was a tall woman, with pale, anæmic appearance, dark hair and eyes; countenance expressive of great suffering; tongue moist, covered with a foul creamy fur; gums spongy; and breath offensive, from the action of mercury. Pulse 90, feeble and irritable; urine natural; bowels had been for some time in a very relaxed condition, but were now more regular; appetite bad; and wakeful.

At the lower part of the abdomen there was a hard tumour, extending from the pubes to within an inch and a half of the umbilicus, more prominent on each side of the linea alba than in the median line. She complained of great pain at the part, and more so in the right hip, as if it had been bruised.

April 16th. Ordered—

Julep rhei comp., ter die sumend.; cataplasma lini abdomini applic. —Beef tea.

17th. She had slept very little during the night, on account of the pain, which was increased even by her removal to the hospital; but in the morning she had become somewhat easier.

18th. Was better this morning; her pain was less; and she had passed a good night. Bowels not opened since her admission. A dose of mist. magnesiæ c. magnesiæ sulphate was given, which relieved them very freely.

20th. The tumour seemed softening on either side of the linea alba, and yielded an indistinct sense of fluctuation; the pain was not so great, but pressure increased it; she slept more comfortably. Her appetite had not returned. Perstet.

24th. The pain and tenderness had increased. The features were more indicative of great suffering than heretofore. Bowels confined. Ordered—

℞. Mist. magnes. c. magnes. sulph. st. sumend. hirud. xij. tumori applicand. Pergat.

25th. Pain much relieved by the application of the leeches. She has slept better. Pulse 100, sharp; tongue still foul; skin hot and dry; countenance still very anxious; fluctuation now more distinct.

27th. She complained of more pain, and of restlessness at night. Tumour rapidly softening. Bowels confined. Ordered—

℞. M. magnes. c. magnesiæ sulp h. statim. pulv. Doveri, gr. v, om. nocte. Pergat.

28th. Had slept better from the effects of the opium, and, indeed, seemed comparatively easy. Countenance not quite so anxious. Pulse weaker and more irritable. Face flushed.

℞. Ammon. sesquicarb., gr. iv. ex. infus. serpentar. t. d. sumend.

℞. Pulv. Doveri, gr. v, o. n. h. s. Pergat.

30th. Much the same. Fluctuation unmistakeable, the fluid being now very superficial.

May 1st. She had passed a very restless night in acute pain. Countenance extremely anxious. She was now evidently beginning to suffer much. The abscess seemed to inclined to point on the left side. Mr. Nason made an incision at the most prominent part of the tumour, and, with the aid of a director and bistoury, enlarged it freely, and evacuated about eight ounces of sanious pus, much to the relief of the patient. The pus had no fæculent odour. The fulness of the left side communicated with that on the right. Ordered—

℞. Quinæ disulph., gr. ij. ex. infus. rosæ co. ter die sumend; cataplasma lini., abdomini applicand.

2nd. Very much relieved. Had passed a good night, and was more free from pain. Tongue cleaner, and appetite improved. The abscess had discharged freely during the night.

3rd. Improving in every respect. There was a copious discharge of pus from the wound, so much so that when she attempted to raise herself (thus making the recti muscles tense from contraction) the matter jetted out to the height of above half an inch. She now took meat, porter, and wine, continuing the quinine and poultices.

[On July 10th the discharge is stated to have quite ceased, and the walls of the cyst contracting on the 29th, she was quite convalescent.]

Case 2. C. S., aged 39, was admitted under Dr. Lever, June 25th, 1851. She had been confined seven weeks before. A week previously she had been seized with bleeding in gushes, which lasted three days, when a piece of something resembling placenta came away. On the 7th day of the bleeding she was delivered by version. After delivery she lay for a week almost unconscious. She had been previously a stout, full-bodied woman; but was much reduced by the large quantity of blood which she lost in this labour. She kept her bed for three weeks, and then only cómplained of dragging pain at the lower part of the abdomen, which a fortnight before became much aggravated, and was accompanied by febrile disturbance. Antiphlogistic measures were adopted, but without affording much relief; and the symptoms continued up to the time of admission. She perceived a fulness on her left side over the left iliac fossa, gradually extending upwards towards the lumbar region, having a fluctuating feel, and being moveable. There had been no shivering. Ordered—

℞. Ammon. s. carb., gr. v. ex infus. serpent. t. d.

℞. Pulv. Doveri, gr. v, o. n. sumend.; hirud. xij, abdomini; vini, f℥iv.

July 4th. There was still a gradual enlargement going on. Fluctuation was more distinct; no rigors. The pulse was to-day somewhat quickened, and there was rather more febrile excitement. Her tongue was white; appetite very much on the decline.

10, p m. The abscess burst while she was making some slight muscular movement, and discharged about two quarts of unhealthy purulent fluid, not mixed with fæculent matter, but having a most fetid and offensive smell; so much so that at first it was doubtful whether it communicated with the intestine. Ordered

Cataplasm. lini, abdom. 4tis horis applic.; pil. opii, gr. j., h. s. sumend.; vini rubri, fℨij, statim.

5th. Dr. Lever saw her to-day and passed a probe into the wound, which led into a circumscribed sac, whence the pus had escaped, and which he found to extend, as the swelling had previously indicated, upwards towards the umbilicus. He did not think that it communicated with the bowel. He ordered her to continue the poulticing, and to have full diet, with twelve ounces of wine and two pints of porter daily. Also infus. rosæ comp. c. quinæ disulph., gr. ij; et vini opii, ℥x, ter die sumend.; pil. opii, gr. j, o. n.

8th. The discharge continuing, the matter became less offensive, and the cyst gave to the touch a sensation of nodulated hardness, as if it were contracting. Her pulse was quiet; the tongue clean; and she was gaining strength; and, with the exception of a little wandering at night, probably in some measure due to the effects of the stimuli, she felt very comfortable. Bowels open.

13th. Her strength daily improving. The discharge of fetid pus had diminished, and the cyst was painless, and firmly contracted and hard.

16th. The discharge was less putrid, as well as less in quantity, cleaner, and more healthy. Her appetite was good, and her nutritious and generous diet showed its effects in her rapidly increasing vigour, and without causing any unpleasant head symptoms. She now slept without her dose of opium.

25th. Regular daily improvement had taken place, and now the discharge had quite ceased. She was quite free from pain. She had been up for a short time daily. Diet continued.

29th. She was almost well, and would soon be able to go out.

Aug. 21st, 1852. She left perfectly cured.

In process of time she became pregnant; was delivered by Mr. Knaggs, from the Lying-in Charity, Guy's Hospital, of a fine full-sized living male on the 7th instant (August), labour being completed by natural efforts and with greater ease than in any of her previous accouchements. Some days afterwards, Mr. Osborne, the second clerk, was called to her, and found her left leg œdematous, and herself much distressed by an attack of irritative fever, which, by active and well-directed measures, were soon subdued.

These cases of abscess of the abdominal parietes have been very common within the last few years, at least several cases have passed under my notice; they have occurred for the most part in women who have been reduced by some exhausting cause, viz., hemorrhage, tedious labour, poor diet, &c. In their treatment, while we endeavour to lessen the local inflammation, we must support the general strength; and under this plan of management I have not known a case to terminate fatally. Sometimes the diagnosis is difficult; but by placing the patient on her

knees and elbows we can at once detect whether the tumour be internal or peripheral.

A proper abdominal bandage should, after cure, be applied, to prevent the formation of a ventral hernia.—*Guy's Hospital Reports, Vol.* 8, 1852, *p.* 30.

158.—*New Mode of administering Iodine.*—M. HANNON has suggested, that when iodine is to be applied to a local tumour, as to a goitre, it should not be rubbed in at once,—a practice which often irritates the skin excessively,—but that it should be placed between two layers of cotton wool, sewed in a bag, and tied directly over the part. The vapour of the iodine rapidly penetrates through the bag, and stains both the skin and the linen. To prevent this, a thin sheet of gutta percha or gummed silk is placed over the bag. It is indispensable to put the iodine between two layers of wadding; if placed merely in a bag, it passes through and blisters the surface like ammonia. Applied in this way, iodine enters the system with great rapidity, and appears in all the excretions.—*Presse Médicale.*—*Med. Times and Gazette, Sept.* 4, 1852, *p.* 242.

159.—*Camphor an Antidote for the Poison of Strychnine.* By DR. I. PIDDUCK.—[It having been stated that for the poison of strychnine no antidote was known, Dr. Pidduck relates the following case.]

J. W——, pianoforte-maker, a weakly man, of intemperate habits, accustomed to work in a hot workshop, and to exposure to cold on his way to and from work, was the subject of severe attacks of rheumatic gout. After one of these gouty rheumatic attacks he was suffering under dyspepsia, neuralgic pains, and general debility. For the relief of these symptoms strychnia was prescribed, in the dose of a *sixteenth* of a grain three times a day. By mistake, at the chemist's, (one of the first in London), the grain of strychnia, with sugar, was divided into *six* instead of sixteen powders.

The first dose taken in the evening produced severe twitchings of the muscles; but the second dose, early in the morning, threw him into violent convulsions. The messenger who came for me said he was dying. Immediately on discovering the mistake, and witnessing one of the frightful paroxysms, I prescribed twenty grains of camphor in six ounces of almond mixture, one fourth to be taken every two hours. The first dose so completely quieted the convulsions that there was no need of a second.

Cases of this kind rarely occur, and I have only this one to adduce, but the incompatibility of strychnia and camphor proves, *pro tanto,* that the one is the antidote to the other. As a general rule, to which there probably may be many exceptions, the poison and the antidote severally are to be found in the three kingdoms of nature.—*Lancet, July* 24, 1852, *p.* 80.

160.—EXPERIMENTS IN ANIMAL ELECTRICITY.

By Dr. du Bois-Reymond.

[The following observations are from an abstract of Dr. du Bois' work on his discoveries in animal electricity.]

On a stand by the window, the galvanometer was placed; and, close to it, on another table, the apparatus by which different parts of muscles or nerves of the human body could be included in the circuit of the galvanometer. Around the galvanometer stood the few visiters present. A frog had just been killed; a portion of one of the muscles was placed in the circuit, Dr. du Bois foretelling that in such a position little or no action would occur; that in another position the needle of the galvanometer would be deflected in one direction or in the opposite one, according to the position of the muscle.

The sensibility of the galvanometer being increased, the same result was obtained with the smallest particle of muscle.

After this, the sciatic nerve of the frog was taken, and it had an action precisely similar to that of the muscle. No difference could be detected in the electrical action of the nerve and muscle.

Then the nerve current was shown to produce contraction of the muscle of the frog's limb by the simplest arrangement. Three cushions of blotting-paper were wetted with salt water; the limb of a frog was taken, and the sciatic nerve was dissected out, but left attached to the limb. The cut upper end of the nerve was placed on two of the cushions, and, in a certain position of the nerve, on connecting the two cushions by means of the third cushion, contraction of the leg immediately took place.

After this, the influence of muscular contraction in changing the electrical action of the muscle was shown; and from this Dr. du Bois passed to the effect produced by voluntarily contracting one arm while the other was left at rest.

This ended the demonstration. The clearness of the results; the skill of the manipulator; the genius, above all, which had directed the investigation, called forth from all the highest praises.

Many asked where an account of these discoveries could be obtained, and were shown two thick octavo volumes in German; and we strongly urged the publication of an abstract.

During his stay in London, Dr. du Bois watched with the greatest interest the English dress, in which his discoveries were about to appear; and without doubt this must give additional value to the facts and deductions which are now before us.

Since the publication of Galvani's original discovery, nothing has been discovered in animal electricity which can be compared in importance and and extent with the discoveries made by Dr. du Bois-Reymond.—*Med. Times and Gazette, July* 10, 1852, *p.* 42.

161.—ON THE MORBID ACTION OF SOFTENED FIBRINE, &c.

By Henry Lee, Esq., Surgeon to the Lock Hospital, Assistant Surgeon to King's College Hospital, &c.

So much care has been taken of late years to distinguish purulent from other morbid fluids, and especially from softened fibrin, that the

idea appears to have become general, that the latter differs essentially from them in its morbid actions. Experiments would appear to show that while pus, under certain circumstances, exercises a very different influence upon the blood to that which is produced by dissolved fibrin, yet under other circumstances their actions are strictly analogous.

When blood stagnates in one of the larger veins of the body, it undergoes certain changes which terminate in the liquefaction of some of its constituents. Thus, in the decolorised masses of fibrin found in the veins after death, it is not at all uncommon to find the central portions in a fluid state. This change is in exact accordance with Mr. Gulliver's experiments upon fibrin when removed from the body, but maintained at its natural temperature. It would appear, however, that this conversion takes place much more readily in certain conditions of the system than in others; and as, on the one hand, the fibro-albuminous portions of the blood may very readily assume the solid form, so on the other hand may these same constituents of the blood, after they have become solid, be reconverted into their fluid condition.

Case.—A gentleman, of a gouty habit, had an attack of low, ill-defined erysipelatous inflammation in the leg; at the same time the femoral vein could be felt as a thickened cord at the upper part of the thigh. An incision having been made in the leg, a small branch of the internal saphena vein was divided, and the blood flowed from it as it would have done from an artery, but without pulsation. This evidently depended upon the blood being prevented from following its natural course by the obstruction in the femoral vein. The blood which flowed from the wound was received on a sponge in some warm water. Almost immediately it separated into its different parts. The decolorised fibrin floated in firm shreds in the water, and adhered in the same condition to the sponge upon which it was received. Some of this fibrin was collected; and, having been separated as far as possible from any admixture of water, it was placed in a clean bottle and corked up. When collected, it was quite as firm as fibrin usually is, and it required some little pressure to force some of the portions through the neck of the bottle. No artificial heat was in this case applied, but on the following day, the whole of the contents of the bottle had become reconverted into their original fluid condition.

The readiness with which the fibro-albuminous portions of the blood may undergo the change from the fluid to the solid, and from the solid to the fluid form, is a point of considerable interest in tracing the mode in which purulent affections of bone may extend, first to the nutritious veins of the part, and subsequently to the general system. When fibrin, which has been allowed to become fluid by decomposition, is mixed with recently drawn blood, it will determine its rapid coagulation. In this respect, the action of dissolved fibrin is analogous to that of pus; but there is this important distinction between the two, that, whereas the coagulum formed by pus is particularly firm, that formed by decomposed fibrin is loose, and however long it is kept, it does not become more solid.

The experiments which I have before published, illustrating the peculiar action of pus upon blood, have been repeated by several per-

sons, and especcially by Mr. Millington, of Edinburgh. The observations of this gentleman led him to the conclusion, that, whereas pus added to living blood determined its rapid and firm coagulation, putrid fluids, on the contrary, either retarded or altogether prevented such an action. From experiments which I have myself made with putrid fluids, I believe this conclusion to be generally true. But the effect of putrid fibrin upon blood affords a marked and very peculiar exception. It is to be remembered, that the blood in the living being is peculiarly subject to the action of decomposed fibrin; and it is in perfect accordance with the usual economy of nature to find the sensibilities of a part peculiarly alive to those influences which are calculated to affect it injuriously. The blood forms no exception to this general rule. Its sensibilities for its self-preservation are as evident as those of other parts of the body, and are called into play in an especial manner in reference to those injurious influences to which it is peculiarly liable. It is seldom that the blood is subject to the direct action of putrid vegetable matters, or even to the putrid secretions from animal bodies. But it is in an especial manner open to the influence of portions of liquified fibrin derived from blood, which for a time has stagnated in some part of the vascular system. The following experiments will show how readily the contact of such is felt by the living blood, and also the means adopted for the preservation of the general mass of the circulatory fluid from its deleterious influence.

Experiment.—Some fibrin of the blood was obtained quite firm, free from any colouring matter, and was kept and allowed to decompose. At the expiration of three or four weeks, it had become fluid and of a dirty light brown colour; a small portion of this was now mixed with some recently drawn blood from a bullock which had just been knocked down. In two minutes from the commencement of the experiment the mixture had formed a uniform soft coagulum: a similar quantity of unmixed blood, taken at the same time, remained fluid several minutes afterwards.

This experiment was repeated with some of the same fibrin in a more advanced stage of decomposition. A half pint of blood was taken from a horse in perfect health, and to this was immediately added a quarter of an ounce of the putrid fluid. The whole coagulated loosely in a minute and a half. The coagulum was kept till the next day, but did not become firmer than it was after it had first coagulated. The effects obtained from the action of decomposed fibrin on living blood are thus shown to be different, both from those produced by ordinary putrid fluids on the one hand, and by pus on the other. The experiment appears to prove, that in case any putrid fibrin should find its way into a blood-vessel, the same means would be in force to limit its influence, to seal the vessel, and to protect the system against its circulation, as would happen if some healthy pus had been similarly introduced. But the soft and loose coagulum in the one case, although as rapidly formed, affords much less protection to the constitution, than the firmer and adherent clot in the other.*

* It is important to notice that these observations apply only to fluid fibrin in a putrid state; whether the effects of fluid fibrin which had not undergone decomposition would be similar, I have not had an opportunity of ascertaining.

When the fluid fibrin has attained a very great degree of putridity, the coagulum formed may not be of sufficient consistence to resist the circulating power of the blood. The morbid poison, when introduced into a vein, will under such circumstances pass without obstruction into the system. The effects produced will then offer a strong contrast to those which result from a similar introduction of pus into the circulation.

The following experiment illustrative of this point was performed for me by Mr. Mayer, veterinary surgeon. A young and perfectly healthy ass was secured, and the right jugular vein exposed. An ounce of fluid, derived from the spontaneous decomposition of portions of the fibrin used in the two former experiments, but in a much more advanced state of putrefaction, was mixed with an equal quantity of water, and injected by means of a syringe into the exposed vein. The vessel did not become "corded," and the circulation was not apparently impeded, as happens when a similar experiment is made with pus. In a few moments, the animal gave three or four groans expressive of much distress. The vital powers at the same time appeared to be suddenly prostrated. The animal was unable to rise, and soon fell into a state of syncope.

The faintness lasted for a few minutes. On getting up, the animal reeled and staggered about for some time, and then recovered sufficiently to walk to his stall. Some reaction now commenced, the breathing was disturbed, short, and quick; the pulse 120 in the minute, small and wiry. These symptoms continued for about an hour and a half, when the animal became very restless and uneasy, evincing internal pain by groaning and looking at his side. All food and water were refused, and death followed four hours after the operation.

On a *post mortem* inspection sixteen hours after death, the jugular vein, into which the putrid fluid had been injected, was found in its natural condition, partially distended with fluid blood. It was pervious through its entire length, and contained no coagula. The lungs were studded with irregularly circumscribed, soft, black patches. When cut into, these discharged a black fluid, having the appearance of a mixture of blood and ink, and of a strong putrid smell. The heart had liquid blood in both its cavities. The cæcum and colon and a portion of the small intestines were deeply congested, and of a dark livid colour. There was an effusion of many pints of serum of the peritoneal cavity; this, as well as the blood throughout the body, had a putrid and very unpleasant smell.

In this case, the putrid injection either prevented the coagulation of the blood in the body, both before and after death, or had the effect (in the event of any coagula having been formed) of determining their speedy reconversion into a fluid state. These results afford the strongest contrast to those produced by the introduction of pus into a vein. In the latter case, the immediate and firm coagulation of the blood presents a barrier against the admission of the contaminated blood into the circulation; or, if by any means this first means of localising the morbid matter should prove abortive, the tendency of the infected portion of the blood to coagulate is evinced in some distant part of the system. In cases where it reaches the lungs, it there pro-

duces firm spherical patches of livid induration, not unlike in appearance to those observed in the experiment last quoted, but differing altogether from them in consistency. In the one case, the patches of congested are produced by the firm coagulation of portions of contaminated blood; in the other, the blood has lost its vital properties together with its power of coagulating, and is already in a state of incipient putrefaction.

In the first instance, the affected portions of lung are at first firm, and an interval is required before they can become softened down; in the other, dissolution commences in the soft, pulpy portions from the first. These general considerations will enable us to trace the progress of disease from a portion, and often a very small portion, of injured cancellous structure of bone to the general system; and to account for the lapse of time which, in the great majority of cases, occurs between the receipt of the injury and the development of its constitutional effects.

When a portion of the cancellous structure of a bone has been injured, the blood in the Haversian canals of the injured part becomes necessarily stagnant between the injury and the next communicating branches. These stagnant portions of blood usually become coagulated and gradually absorbed. If the wound in the bone should suppurate, they at first serve the very important purpose of closing the vessels against the secretions of the part: an office which is subsequently much more permanently performed by the process of adhesive inflammation. It will occasionally happen here, as in the larger veins of the body, that the contents of the injured blood-vessels will become mixed to a greater or less extent with the secretions with which they are in contact. This may arise from some accidental mechanical cause, or from some inherent defect in the coagulating power of the blood.

The admixture of diseased secretions will determine the coagulation of those portions of the blood with which it comes in contact, and thus the coagula will extend farther along the vessels than they would have done, had the blood at first firmly sealed the divided extremities of the veins. Uncontaminated blood will remain for a long time in the living body, either in its solid or fluid state, without undergoing much alteration; but this is not the case when the blood has become mixed with vitiated fluids. Farther changes will then readily take place in it; and we may judge of what takes place in the minute vessels of bone, by that which can be better observed in the larger veins of the body.

There appears no doubt, from evidence derived from direct experiment, that a coagulum formed of vitiated blood may, and often does, in healthy states of the constitution, become gradually and entirely absorbed and eliminated from the system by the intestinal and hepatic secretions; but at other times, the vitiated and perhaps loosely formed coagulum becomes softened down and poured into the adjacent veins. It here determines one of the three following physical results.

1. The dissolved matter of the first formed coagulum mixing with fresh portions of blood may lead to the formation of fresh coagula. These may retain for a time the vitiated fluid; and, adhering at intervals to the sides of the vessels in which they are contained, they may prevent any of the foreign matter from reaching the general circulation. Within a short

period, however, the centre of the newly formed coagula will become softened and gradnally deprived of its colouring matter. The process of softening will proceed from the centre towards the circumference of each portion, until nearly the whole is converted into a white fluid resembling pus. Should there be an opening in the bone, this may escape externally; but otherwise, increasing in quantity by the secretions of the surrounding parts, it is forced forward in the course of the circulation to contaminate and mix with fresh portions of blood, which, in their turn, first become coagulated, and then softened down, and converted into the same purulent looking fluid. If an opening be made in a bone in which this process is going on, not only the cancellous structure, but the Haversian canals will appear filled with pus. It occasionally happens, under these circumstances, that on making an opening into a bone, a distinct little jet of purulent looking fluid may be seen to escape from one of the canals of the nutritious vessels. In such a case, the cavities of the vessels must of course be accurately closed by firmly adhering coagula in the surrounding parts.

The effects of purulent contamination of the blood usually extend in the course of the circulation.

Case.—A man, twenty-six years of age, had a blow upon the head which fractured his skull, causing at the same time a scalp wound, which left a portion of the bone denuded. Eighteen days afterwards, he complained of pain in the head, accompanied by nausea. To this succeeded what he termed "soreness of the stomach," which was soon followed by drowsiness and insensibility. He then became paralysed, and a good deal of irregular muscular twitching was observed in different parts of his body. He died a week after the commencement of the above symptoms. Yellow matter was found in the diploë of the parietal bone in the neighbourhood of the fracture, and purulent looking fluid, mixed with flakes of fibrin or lymph, occupied the *posterior half only* of the longitudinal sinus.

It sometimes, however, happens that the effects of the disease extend in a course opposite to that of the circulation. In these instances, it is probable that the whole mass of the blood has become, to a certain extent, contaminated, those portions which are kept at rest being the most liable to become first coagulated and then softened down. This is not unfrequently observed in cases of infection of the blood after childbirth. The blood in the common iliac vein will become coagulated in consequence of some diseased fluid poured into it from the uterus. This will cause the blood in the femoral and saphena veins to stagnate. Portions of the contaminated and stagnant blood in these, and in the vessels which supply them, will then become coagulated and undergo subsequent changes, involving the coats of the veins and neighbouring parts. Thus the disease will appear to have extended downwards, in a course contrary to that of the circulation. In the same way we must explain the curious fact, that after amputation of one leg or thigh, an abscess will occasionally form in one of the veins of the opposite limb. In such cases, *post-mortem* examinations sometimes show that the coagulation of the blood has extended from the amputated limb to the vena cava. An obstruction there would of course act equally upon both sides of the

body. It is a remarkable fact in these cases, that the coagulum will never extend beyond the opening of the hepatic veins; the double current from the portal system and from the veins opening into the inferior cava being sufficient to carry forward any viscid contents of the vessel.

2. When the blood has become infected, instead of coagulating, it may separate into its different elements. In this case the fibrin is left unmixed with either the serum or the colouring matter of the blood. This process differs from that of coagulation in this, among other important particulars, namely, that whereas a coagulum formed of all the parts of the blood fills the vessel which contains it, the separation of the blood into its different parts leaves the fibrin alone in the vessel, and allows the more fluid parts to pass on into the general circulation. The consequence of this is, that the vessels in which such an action has taken place still remain pervious. The blood can still pass between the fibrinous deposit and the walls of the vein in sufficient quantity to carry on, although imperfectly, the natural circulation of the part; such a condition, unlike that of coagulation of the blood, offers no security against the passage of any diseased secretions along the vessels. This tendency to the separation of the blood into its different parts was strongly marked in the blood which has been detained in the saphena vein in the first case above related. It would appear to be an action which not very unfrequently takes place in the body, although necessarily difficult to illustrate with regard to the smaller veins. I have lately, however, had an opportunity of observing this change in the capillaries of the liver. From each small tube a delicate thread of fibrin could be drawn, leaving some of the fluid parts of the blood in the vessels, which were stained of a darker colour than natural.

A case lately published in the 'Gazette Médicale de Paris,' affords a very good example of this separation of the fibrin from the other elements of blood. The case was that of a soldier, who died in St. Michael's Hospital, having suffered for a long period with symptoms of disease of the chest. Four months before his admission into the hospital, without any apparent cause, and in a single day, the eyelids and the cheeks became considerably swollen. The lower extremities and the forearms became at the same time œdematous. Upon a post-mortem examination the vessels of the left lung were found to contain fibrinous concretions, having the form of ramified cylinders, which extended through the pulmonary artery into the right ventricle of the heart. Those concretions were white, or of a rus-nut colour, solid and resisting. They adhered but very slightly here and there to the lining membrane of the vessels, and were in some parts of the pulmonary artery, and of its larger branches, surrounded by a layer of semi-fluid black blood.

A similar condition has been observed with regard to the vessels of the brain; the longitudinal sinus has been observed to contain a firm yellow fibrinous mass, extending on the one hand in an arborescent form to the vessels of the pia mater, and on the other to the jugular veins.

In such instances, the sudden increase of the symptoms may mark with tolerable certainty the period at which the greater part of the fibrin is deposited, but this would appear to take place gradually in the ma-

jority of instances; and it is probable, as in the case of the soldier above mentioned, that it may exist for a long period, during which the circulation may be carried on sufficiently for the purposes of life. Upon a post-mortem inspection, the firm decolorised fibrin may at once be distinguished from the blood which has coagulated around it after death.

3. The contaminated blood, instead of coagulating, or of separating into its different elements, may decompose. The whole of the constituents of the blood are then together involved in the changes which take place. The experiments above related shew that the same impediments will not, under such circumstances, be offered to the passage of morbid matter into the circulation as when the blood firmly coagulates in the veins. An interval, however, even in the most strongly marked cases usually elapses between the development of the infecting cause and the manifestation of constitutional symptoms. This is especially the case where diseased secretions enter the circulation through the nutritious vessels of bone. The morbid matter is detained for a certain time, during which the process of decomposition is established. The first infected portions of blood, together with the morbid matters which they contain, then pass on to infect the blood in adjacent vessels. The dissolved and putrifying fibrin from these will proceed further towards the centre of the circulation; in its course it will loosely coagulate fresh portions of blood, and then determine their decomposition. Each fresh portion of blood that is infected will add to the quantity of putrid dissolved fibrin in the vessels, and thus the disease will propagate itself, quite independent of the original source whence the morbid matter was derived. Each portion of blood which is attacked loses its vitality, passes into a state of decomposition, and becomes itself the means of infecting other portions. The contaminated blood may then be found in the vessels in every stage of decomposition, or it may have passed out of the vessels, having stained them during its decomposition of a deep livid colour. Long tracks of deep purple veins will occasionally be found, some being blocked up with the viscid blood in various stages of decomposition, and some having discharged their contents, and being comparatively empty.

Case. A man of rather intemperate habits received a kick from a horse on the right leg, on the 15th of October, 1851. The right tibia and fibula were fractured, and the fracture communicated with a wound in the skin. He was purged, and kept upon low diet. On the 22nd, some redness was observed around the wound, and the cellular tissue in the neighbourhood felt boggy. On the 1st Nov. he vomited after taking food, and on the following days he had several attacks of shivering. On the 4th, his complexion was yellow; he experienced no pain. Five days after this he died.

No union had taken place between the fractured extremities of the tibia, and the parts immediately around the broken portions of the fibula were in a sloughing condition. The superficial and deep veins of the leg and thigh were greatly distended with dark thick blood, but contained no coagula. The iliac veins contained small soft and dark coagula, but were otherwise healthy. In the middle of the right lung were two patches of secondary inflammation, and the right lobe of the

liver contained several secondary abscesses, surrounded by firm and dark texture.

The examination of the following case, conducted by Dr. J. W. Ogle, I had the opportunity of witnessing through the kindness of Dr. Wilson, of St. George's Hospital. A married woman, twenty-three years of age, miscarried, during the sixth month of her pregnancy, on the 4th of June, 1851. A few days afterwards she was attacked with intense pain in the abdomen, and two or three days later with pain in the calf of the left leg. The pain in the leg was accompanied by some swelling, which afterwards extended up to the thigh. She died on the 11th of July.

A small putrid abscess occupied the course of one of the branches of the left hypogastric vein, at a short distance from the neck of the uterus. The iliac and the femoral veins of the same side were filled with blood in every stage of decomposition. The spermatic vein of the same side was stained of a dark purple colour, but its canal was pervious and contained no coagula.

When the blood in one of the larger veins of the body decomposes, as in the preceding case, the period at which severe constitutional symptoms follow is comparatively short. Analogous affections originating in the minute vessels of bone usually require a longer period for their development. This is illustrated in the following cases.

H. B., aged 19, sustained a fracture of the fibula. Three months after the accident, and three weeks before his death, he had an attack of diffuse cellular inflammation in the leg, which terminated in suppuration of the knee-joint. Upon examining the limb, the tibia in the neighbourhood of the fracture was exposed, and its structure was soft and of a black colour.

J. C., aged 45, had an extensive scalp-wound. Nineteen days afterwards, he experienced a rigor, and shortly became paralysed on one side. A portion of the skull, which was exposed, presented a dark green appearance, and when removed with the trephine, was of a putrid odour. The longitudinal sinus in this case contained contaminated blood, and there were secondary abscesses in the left lung.

In some cases, where the most severe constitutional symptoms have followed injuries of bones, the original lesion has appeared of no very great importance, and the surface of bone exposed has been of very limited extent. In the following instance, the original injury was not regarded with any apprehension, yet it proved speedily fatal after the appearance of the symptoms of secondary inflammation.

E. P. aged 50, had a lacerated wound of the foot, which detached a small portion of the base of the fifth metatarsal bone. This bone was also simply fractured towards its centre. After having for some time progressed without any unfavourable symptoms, pain in the chest, a rapid pulse, depression, with delirium, suddenly made their appearance, and were found, on a post-mortem examination, to have arisen from inflammation of the right pleura, and the formation of secondary abscesses in the right lung. The amount of contaminated blood contained in the injured bone must in such instances be very small; and there can be little doubt that recovery would take place much oftener than it does,

did not the disease propagate itself in the blood. When this takes place, it is usually indicated by one of the three classes of physical changes above described. The different natural processes which they illustrate may, however, take place in various degrees in the same case; and the condition of the blood upon post-mortem inspection will, in different parts of the vascular system, present corresponding varieties.—*London Journal of Medicine, Sept.* 1852, *p.* 796.

162.—INDIAN HEMP AS AN OXYTOCIC.

By Dr. John Grigor, Nairn.

[Dr. Grigor gave the Indian hemp in sixteen cases, a tincture being made of 24 grains to the ℥j. In nine of these cases, though given to the extent of ʒiiss. in separate doses of 25 or 35 drops, no effect was produced except in one case, in which the pains were arrested and sleep induced, after which labour commenced in earnest naturally.]

In seven cases in which the tincture of hemp succeeded so well with me, five were cases of first confinement, of satisfactory though very slow labour, and phlegmatic temperament. I have noticed the contractions acquire great increase of strength and frequency immediately on swallowing the drug, and have seen four or five minutes elapse ere the effect ensued; and if none was induced within the latter space of time, I have not observed its effects at all afterwards, notwithstanding repeated doses. In these few cases, I had opportunities of giving it from the time when the os uteri would admit the point of my finger till the expulsion of the child. Judging from experience, I believe that, in appropriate cases for the use of this stimulant, and when effectual, it is capable of bringing the labour to a happy conclusion considerably within a half of the time that would otherwise have been required, thus saving protracted suffering to the patient, and the time of the practitioner.

I have not observed it to possess any anæsthetic effects. I have used it in two cases along with the inhalation of chloroform, and I did not observe that that agent interfered in any way with its action.

When the effects of the hemp were subsiding, I have been able to recall and keep up "the good pains" by the addition of ten drops given from time to time. I consider the expulsive action of the cannabis to be stronger than that of the ergot, but less certain in its effect; and it has the advantage over the ergot, of usefulness in the early stage of parturition. I believe that the previous ineffectual administration of the hemp does not interfere with the after-exhibition and full working of the ergot.

Such are my brief observations on the new and interesting use to which Bang, or the Hachisch of India, has been put. In the few cases in which I thought its administration safe, and not counter-indicated by malformation, &c., you have given, the result of those in which this effect was, and was not, displayed. I cannot conclude these remarks without entering my dissent against the use of uterine medicinal stimuli in general, on account of the frequent difficulty of accurate conception of relative dimensions of parts, &c. Yet all obstetricians must acknowledge

that, in many cases, such stimuli are indispensable; and to be possessed of one capable of so early application, is decidedly a matter of much importance. I would also notice that, in labour, whether the cannabis shows its peculiar effect on the uterine contractions or not, there seems, as in tetanus, &c., to be a very great tolerance of the drug—nor have unpleasant consequences, so far as I have seen, appeared afterwards; and, whilst it is acknowledged as a powerful controller of inordinate muscular spasm, it is equally in many cases, a powerful stimulant of the uterine muscular fibre in labour, if not in the unimpregnated state.—*Monthly Journal of Med. Science, Aug.* 1852, *p.* 125.

163.—ON THE THEORIES OF ANIMAL HEAT.

By Sir B. Brodie, Bart.

The general evidence in favour of the chemical theory of animal heat has received many important additions of late years. The fact that a considerable amount of heat is generated by plants during the processes of germination and flowering, when, like animals, they withdraw a large amount of atmospheric oxygen, and replace it by carbonic acid set free from their own tissues, has long been known; and very careful observations upon the *Colocasia odora*, a plant of the Arum family, which is remarkable for the elevation of temperature which its spadix undergoes at the height of the flowering-period, have demonstrated that the production of heat is constantly accompanied by the generation of carbonic acid, that it does not take place if the flowers be made to expand in an atmosphere of nitrogen, and that during both the attainment of the highest point and the subsequent decline, there is a close correspondence between the amount of oxygen consumed in successive hours, and the excess of heat shown by the spadix above that of the surrounding medium. So, again, the researches of Mr. Newport upon insect temperature have shown that the same constant coincidence exists between that generation of heat which they occasionally exhibit, and the replacement of atmospheric oxygen by carbonic acid. Moreover, since we may regard it as all but demonstrated, that the animal can under no circumstances convert the non-azotized saccharine or oleaginous compounds so abundantly supplied by plants into the albuminous constituents of its own tissues, the large amount of these substances consumed by animals, and the provision obviously made for their digestion and for their reception into the circulation, become utterly meaningless, if they are not introduced for the express purpose of being applied to the maintenance of the combustive process, and the consequent generation of heat. Further, the direct effect of withholding food altogether, as the experiments of Chossât have shown, is to produce a complete absorption of the fat, which, with the products of the waste of the azotized tissues, is burned-off day by day for the maintenance of the animal temperature; the duration of life in this condition is strictly proportional to the amount of combustive material previously stored up in the form of adipose tissue; and when this is all exhausted, the heat of the body, which had previously suffered

but little decline, diminishes from hour to hour, until the animal dies of cold—the application of external warmth being still able to arouse it to activity, even when it has sunk into a state of torpor approaching to coma. All experiments upon the respiration, moreover, concur in showing that the liberation of carbonic acid is much more rapid at low temperatures than at high; showing that there exists within the system some means of self-adjustment, whereby the amount of fuel consumed is proportioned to the quantity of heat which it requires to produce, for the maintenance of its temperature at the regular standard.

The recent researches of M. Bernard upon the functions of the liver, leave little room for doubt that one of the most important purposes of this organ is to prepare the respiratory pabulum; not so much, however, in the mode originally supposed by Liebig, by separating it from the blood as bile, this to be reabsorbed and subsequently burned-off in the lungs; but rather by transforming, without separation, certain materials previously contained in the blood, so that as the current passes through this gland, both the substances newly-absorbed from the alimentary canal, and those which have been taken up in the course of the general circulation, are subjected to its influence, and then pass on, through the right cavities of the heart, to the pulmonary vessels, in a state of peculiar fitness to undergo a further transformation by the influence of the oxygenated atmosphere which they there encounter. The combustive materials directly supplied by the food are chiefly, in herbivorous animals, those of the farinaceous and saccharine, and those of the oleaginous types. The farinaceous matters are converted by the digestive process into the saccharine form; so that grape-sugar is found in the mesenteric veins after the ingestion of such aliment, as is also cane-sugar if this have been taken in. But the blood is not very tolerant of the presence of grape-sugar, still less of that of cane-sugar; so that if these substances be injected into the *jugular vein* in any quantity, they are speedily detectible in the urine. During their passage through the liver, however, they are converted into a new form of sugar, which has been termed "liver-sugar," the characteristic properties of which seem to consist in its differing from grape-sugar, as grape-sugar differs from cane-sugar, that is, in being far more tolerated by the blood, and in being more readily converted into lactic acid. Hence when grape-sugar and cane-sugar are injected into the *vena portæ*, they do *not* show themselves in the urine; and the liver-sugar which is produced by their transformation is not traceable further than the pulmonary vessels, being speedily transformed, and in great part eliminated (probably passing through the intermediate stage of lactic acid) by the respiratory process. But it is one of the most curious results of M. Bernard's researches, that the liver not only thus transforms other saccharine compounds, but that it generates sugar *de novo*, under circumstances which seem to forbid our regarding it as anything else than a product of the retrograde metamorphosis of the albuminous compounds. For M. Bernard has found sugar in the liver and hepatic blood of carnivorous animals, and even in the liver of the mammalian fœtus and and of the embryo chick; and so constant does the presence of this substance appear to be, that the production of a peculiar kind of sugar, specially fitted for undergoing the combustive process, must henceforth

be regarded as one of the most important functions of the liver. It has been supposed that the sugar generated by the liver may be derived from fatty matters brought to it by the vena portæ; but we cannot find in Bernard's experiments any evidence of this; and whilst we have no chemical reason for believing that sugar can be formed by the transformation of fat (which would be an inversion of the usual order of metamorphosis) we know that it may be generated as one of the products of the disintegration of muscular tissue, the juice of flesh having yielded *inosite*, a new form of sugar, to the analyses of Scherer.

It has been further shown by M. Bernard, that the liver produces a peculiar fat, from the constituents of the blood which passes through it; and it seems that this liver-fat, like the liver-sugar, may be the product of the transforming process, exercised alike upon materials newly absorbed from the alimentary canal, and upon the products of the disintegration of the tissues. That albuminous compounds in a state of retrograde metamorphosis may generate fatty matter, can scarcely, we think, be any longer questioned; since the phenomena of fatty degeneration concur with chemical evidence, to prove that this is one of the forms into which their elements pass, in preparation for their egress from the body.

Thus, then, it appears that the *respiratory pabulum* of carnivorous animals, which is derived from the decomposition of the albuminous constituents of their food and of their own tissues, precisely corresponds with that which is furnished to the herbivorous races in the non-azotized articles of their diet; that the liver may be regarded as an organ specially destined to alter the characters of the blood, not merely by what it separates *from* it, but also by the changes it makes *in* it; and that these changes have reference to the constant sustentation of the combustive process, by the preparation of certain organic compounds peculiar to the living body, of a nature that may enable them readily to undergo oxidation when exposed to the air. And it is a most interesting and suggestive fact, that the products of the disintegration of the system should thus be applied—by passing through the very same course—to the same final uses, as are served in a large proportion of the animal kingdom by organic compounds that cannot be rendered subservient to the production of animal tissue. We can scarcely fail to see in the whole of this arrangement, not merely a means of freeing the system from effete matters, but a scheme for the regular supply of the combustive apparatus with appropriate fuel; and those, if such there be, who deny that the production of animal heat is essentially dependent upon the conversion of hydrocarbonaceous compounds into water and carbonic acid, have to explain how these compounds can be eliminated, as we know they are by means of this oxidating process, *without* the production of heat; and they have also to explain why the herbivorous animal should be instinctively impelled to ingest a large amount of food, that can serve no histogenetic purpose in the economy, and why their digestive apparatus should be specially adapted to the reduction, solution, and conversion of non-azotized compounds, as well as to the introduction of azotized matter into the system.

The recent researches of M. Barral 'On the Statics of the Human

Body,' have afforded much additional information upon the subject of our present inquiry. He has carefully determined the ultimate constituents of the food, and of the various excretions, of four individuals, during five days, experimenting thus upon himself also during summer as well as in the winter; and presents us the results in an elaborate series of tables. We shall cite only a few of the most important. In the first place, the *carbon* of his food amounted to 5654·1 grains in winter, and 4090 grains in summer; and of this the proportion ejected in the form of *fæces* was 236·2 grains in winter, and 137·4 in summer; that eliminated by the *urine* was 234·6 grains in winter, and 211·5 grains in summer; whilst that which passed of by exhalation (pulmonary and cutaneous, the latter, however, being an insignificant fraction) was no less than 5183·3 grains in winter, and 3741·1 in summer. Thus we see how large a proportion of the carbon of the food is thrown upon the respiratory process for elimination, and how considerable a diminution takes place in the amount exhaled during the heat of summer, involving a corresponding difference in the demand for aliment. M. Barral's researches appear to afford the means of determining, approximatively at least, how much of the *hydrogen* of the food is oxidized in the respiratory process, and how much of the water exhaled is really generated combustively. He found that of the whole amount of hydrogen taken-in, not more than from one-eighth to one-tenth passes off by the other excretions, the remaining seven-eighths or nine-tenths being exhaled in the condition of watery vapour by the lungs. Now of the *oxygen* ingested, he found that 3841·4 grains in winter, and 2757·6 grains in the summer, passed of by the lungs in the condition of water; and this would, of course, carry off its equivalent of hydrogen, also derived from the food, without any production of heat.* But the amount of hydrogen actually exhaled was 801·3 grains in winter, and 597·5 grains in summer; so that, after deducting one-eighth of the weight of the oxygen, there remain 321·1 grains in winter, and 252·8 grains in summer, as the amount of hydrogen which could not have been oxidized and eliminated as water, save at the expense of the oxygen of the air, and which must therefore have undergone a combustive process whereby heat could not but have been generated.

Thus it appears certain, that we are not to look only at the combustion of carbon, but to that of hydrogen, as a source of animal heat; but it is scarcely fair to reckon (as Professor Liebig has done) the whole surplus of the oxygen absorbed, above that contained in the carbonic acid exhaled, as being consumed in this mode. For there are other oxidizing processes going on within the system, some of them of no mean importance; more especially the production of the sulphuric and

* This will be obvious enough if we take the simple case of sugar, which is carbon + the components of water, already united in equivalent proportions; the carbon being eliminated by combustion, the water remains, to be carried of as such. A fatty body, on the other hand, is carbon + hydrogen + the components of water; here a portion of the hydrogen, as well as the whole of the carbon, is destitute of its equivalent of oxygen; and water is actually generated in the combustive process, in addition to that whose components were already united in the substance, although under another form.

phosphoric* acids from the sulphur and phosphorus contained in the protein-compounds of the food, giving rise to the production of the alkaline sulphates and phosphates which are excreted by the urine. In fact, it may probably be stated, that there is scarcely a single chemico-vital transformation in the body, either *progressive* (that is to say, tending to the formation of living tissue) or *retrograde* (that is, tending to the reduction of the more complex histogenetic substances to the comparatively simple compounds which present themselves in the excretions), in which oxygen is not concerned. Thus, then, although the production of carbonic acid and water may be immediately effected by the combustive metamorphosis of saccharine and fatty matters, and although these matters, when not directly supplied as such by the food, are prepared within the body for the respiratory operation, yet the process of such preparation is one that really involves a great number of separate stages of metamorphosis, beginning with the conversion of alimentary materials into living tissue, and including all the changes which take place during the life of that tissue, and in the progress of its final disintegration. Hence although the production of such part of the carbonic acid and water, as proceeds directly from the union of the carbon and hydrogen of the alimentary materials with the atmospheric oxygen, *may* be looked on as a simple combustive operation, yet as to the whole of the remainder, which proceeds from the disintegration of the tissues themselves, it must be admitted that the appearance of a given quantity of carbonic acid in the expired air, can only be looked on as the exponent or manifestation of a long series of changes of composition taking place in the interior of the body, of which it is one of the ultimate products. Some of the advocates of the Chemical theory of Animal Heat, have spoken of the body as if it were a mere furnace, into which a certain quantity of fuel is put, whose combustion affords a given equivalent of heat; whilst from its chimney there proceed so much carbonic acid, so much water, and so much imperfectly-consumed smoke. The whole series of intermediate operations, whose original materials and final products alone are thus recognised, is completely ignored; and the confident assertions of the chemists, based, as they appeared to be, upon a very broad foundation in fact, have passed muster with the general, and even with the medical

* Professor Liebig has lately asserted, with his usual dogmatism, that no phosphorus exists in the body, or in the alimentary materials, except in the state of phosphoric acid, and further, that the notion that such other compounds of phosphorus exist in the body, and that phosphorus occurs in the protein-compounds in a state analogous to that in which sulphur exists in them, "proceeds generally from amateurs in science, and rests on superficial observations, without the slightest scientific foundation." (See his 'Familiar Letters,' 3rd edition, pp. 451, 2.) We apprehend that several chemists, of no inferior authority as analysts, maintain a different opinion; and that there is abundant physiological evidence, derived from the occasional luminosity of the urine, breath, and sweat, as well as of the solids of the body when undergoing decomposition after death, or even before life is extinct, which proves the existence of phosphorus either in a basic or in an imperfectly oxidized condition, as one of the normal constituents of the body; this phosphorus being usually completely oxidized within the system, and carried off as phosphoric acid in combination with alkaline bases, but passing into the excretions in its lower state, when, either from an absolute deficiency of respiration, or from the greater demand for oxygen set up by other matters contained in the blood (alcohol, for example), it does not undergo complete metamorphosis.

public, notwithstanding that there is a considerable body of facts, which are not only not explained by chemical doctrine, but which seem, at first view, to be really in antagonism with it. These facts cannot be passed over, either by the scientific physiologist or by the observant practitioner; for they force themselves upon the attention of the latter; whilst they must be recognised by the former as having no less a title to his consideration than have the ordinary phenomena of calorification;—we refer to the local development of heat, or to local deficiency, altogether irrespective of the activity of the circulation; and to the connexion of such irregularities with peculiar conditions of the nervous system.—*Brit. and For. Med.-Chir. Review, July* 1852, *p.* 144.

164.—ON THE USE OF MANGANESE AS AN ADJUVANT TO IRON.

By M. Petrequin.

M. Pétrequin quotes various authors to prove that manganese is a normal constituent of animal and vegetable tissues; and believes that wherever iron is present in appreciable quantity, manganese coexists with it. Hence iron alone will not always succeed in blood-diseases. M. Pétrequin has observed many cases of chlorosis, which have resisted iron as obstinately as anæmia connected with cancer or organic degeneration. Other cases again, after deriving a certain amount of benefit from iron, remain stationary. Others again appear cured by iron, but the cure is not permanent. The remedy required in these cases, M. Pétrequin finds to be manganese. He does not give it or iron alone; but combines them.

It is especially in *diseases of the blood* that ferro-manganic medicines are useful. They have a special action on the vascular apparatus, on the formation of the blood, and on the circulating fluid itself. They do not act merely as tonics or astringents; but are regenerators of the blood. They have succeeded admirably in anæmia following hemorrhage, operations, polypi, metrorrhagia, &c.; also in the chlorosis attending puberty, which is a more common disease than is generally supposed, and occurs even in males. M. Pétrequin has also frequently found the combinations of iron with manganese of benefit in the diseases of women at the critical period. He has often seen, in these subjects, *metrorrhagia*, accompanied with an aspect of the surface which would lead to the suspicion of organic uterine disease; the hemorrhage, however, was but a complication, and the patients, apparently in a hopeless state, have recovered under the use of ferro-manganic preparations, conjoined with tonics and ergotine.

In *amenorrhœa* and *dysmenorrhœa*, the patients often imagine that they require to be bled; but care must generally be taken not to comply with this request. M. Pétrequin has more than once seen cases of amenorrhœa with severe chlorosis, in which it has not been desirable to hasten the appearance of the catamenia—the consequent loss of blood aggravating the disease. The general state of health must here be care-

fully attended to. Œdema of the lower limbs sometimes occurs in these cases; but it is a less severe complication than when it attends metrorrhagia. It often disappears, as the patient recovers, under the use of iron and manganese.

These medicines are no less efficacious in the treatment of *anæmia* resulting from prolonged intermittent fevers, prolonged suppuration, strumous, syphilitic, or cancerous affections, phthisis, &c. Pills and the syrup of the iodide of manganese and iron are preferable in these cases.

In all these cases, the ferro-manganic preparations do not merely act on the stomach and nervous system, but they are absorbed, and assist in the formation of hæmatosine and new blood-globules, so as to restore the blood to its normal condition. Their effect in this way is greater than that of iron alone.

In the *functional affections of the heart* connected with chlorosis and anæmia, and which must not be mistaken for organic disease, a combination of iron and manganese with digitalis and other moderators of the heart's action is advantageous. The same remark applies to the *functional disorders of the lungs*, attending the same constitutional states.

Disordered states of the nervous system are intimately connected with those of the blood. M. Pétrequin has found that the ferro-manganic preparations succeed well in these, even though uncomplicated with chlorosis. He, as well as M. Gubian, has observed that iron is here better tolerated when combined with manganese. He has also seen benefit from the use of iron with manganese in many cases of *dyspepsia*, *gastralgia*, and *gastro-enteralgia*. Nervous affections of the digestive organs are often the result of chlorosis; and, where stomachics and cinchona have failed, iron has often been found (especially the carbonate, by some English physicians) to be of service. Gastrodynia complicating chlorosis has often yielded to the use of ferro-manganiferous water, and to pills of carbonate of iron and manganese.

In *nervous affections connected with exhaustion* from venereal excesses, onanism, rapid growth, &c., as well as in leucorrhœa, diabetes, &c., M. Pétrequin has a high opinion of these medicines. He is continuing his researches on their action in certain cases of sterility from asthenia, and in some hyposthenic affections of the scalp, such as early baldness, alopecia, &c.

M. Pétrequin has confined his observations to a limited number of the ferro-manganic preparations; and has made many observations before publishing the formulæ which he finds most useful. Having found, even at an early period, that the medicines were liable to adulteration, he has availed himself of the assistance of competent pharmaceutists. Since the publication of his first memoir, in 1849, these medicines have been extensively used in the south of France and in foreign countries.

The formulæ are few, and correspond to the preparations of iron generally used in France. They are: 1. *Pills* of carbonate of iron and manganese, or of iodide; 2. *Lozenges* of lactate of iron and manganese; 3. *Syrups* of lactate or of iodide of iron and manganese; 4. Ferro-manganic *chocolate;* 5. *Effervescing solution* of iron and manganese.

It has been observed that manganese not only preserves water, but purifies that which has undergone change (Martin-Lauzer). Ferro-

manganic waters (of which there are many in France and other parts of the continent) can be preserved and carried to a distance;—which cannot generally be done with simple ferruginous waters.

M. Pétrequin commences by giving the powder of iron and manganese, with some vinous drink; he then administers two pills daily, one before breakfast and one before dinner, replacing them soon by the lozenges. The syrups and chocolate complete the treatment. He gives the medicines at meal time. The syrup he gives before breakfast, in doses of a tea-spoonful; and he finds it useful to administer directly after it some infusion of centaury, or of camomile flowers and orange.

Large doses are unnecessary and useless; for they are liable to produce irritation of the stomach and exhaustion of the nervous system; and the reparation of the blood is slow and progressive, and cannot, even were it desirable, be effected rapidly. Besides, the iron and manganese are not absorbed in any greater quantity, if large doses are given.

Preparations of Manganese and Iron.—M. Burin-Dubuisson, of Lyons, who prepared most of the ferro-manganic combinations used by M. Pétrequin, has published an interesting *brochure*, in which he gives the necessary details relating to the subject. The following formulæ are extracted from it.

Powder for Effervescing Solution of Manganese and Iron. Take of coarsely powdered bicarbonate of soda, 20 parts; tartaric acid, 25 parts; powdered sugar, 53 parts; finely powdered sulphate of iron, $1\frac{1}{2}$ part; finely powdered sulphate of magnanese, $\frac{3}{4}$ part: mix carefully, and keep in well stopped bottles. A teaspoonful is mixed with each glass of wine and water drunk during meal time.

Pills of Carbonate of Iron and Manganese. Take of pure crystallised sulphate of iron, 75 parts; pure crystallised sulphate of manganese, 25 parts: crystallised carbonate of soda, 120 parts; honey, 60 parts; water, a sufficient quantity. Pills of 20 centigrammes (3 grains) are made; they keep easily, without becoming oxidised, in well-closed vessels. From two to four are given daily.

Ferro-manganic Chocolate. One part of carbonate of iron and manganese is first mixed with four of sugar, and divided into large lozenges; of these 100 parts (grammes) are mixed with 500 of chocolate paste, in the preparation of which 100 parts of sugar have been left out. This will make 800 lozenges, each of which contains about 3 centigrammes (nearly half a grain) of carbonate of iron and manganese. The chocolate decomposes the hydrated carbonate of manganese and iron of the saccharate into hydrated sesquioxide of iron and manganese; there is no metallic taste.

Syrup of Lactate of Iron and Manganese. Take of lactate of iron and manganese, 4 parts; powdered sugar, 16 parts; rub together, and add of distilled water, 200 parts; dissolve rapidly, and pour into a matrass over a water-bath, containing 384 parts of broken sugar: filter the solution. This syrup contains about 15 parts of lactate of iron and 5 of lactate of manganese in 3000 parts. One or two spoonfuls are taken daily.

Lozenges of Lactate of Iron and Manganese are made by adding 20 parts of the lactate to 400 of fine sugar, with a sufficient quantity of

water. The mass will make 840 lozenges; of which six or eight are taken daily.

Pills of Iodide of Iron and Manganese. M. Burin-Dubuisson forms a solution of iodide of iron and manganese, in the proportion of one part by weight to two of water: the proportion of the salts is about three of iodide of iron to one of iodide of manganese. Six parts of this are mixed with 294 of simple syrup; of this, M. Pétrequin gives one or two spoonfuls daily.

Pills of Iodide of Iron and Manganese. Take of the officinal solution prepared by M. Burin-Dubuisson, 16 parts (grammes); honey, 5 parts; some absorbent powder, 9½ parts. Divide into 100 pills. The honey and the solution are first mixed, and evaporated at first rapidly, then more slowly, to 10 parts. Then add the powder, and divide the mass into four parts, which must be rolled in powder of iron reduced by hydrogen; each of these must then be divided on an iron plate into 25 pills, and again rolled in the iron powder. Finally, they are covered with a layer of tolu, according to M. Blancard's process.

All these preparations must be made very carefully. M. Burin-Dubuisson has ascertained that the commercial salts of manganese frequently contain copper, and even arsenic; he hence insists on the necessity of calcining the sulphate of manganese, twice, or more frequently, at a dark red heat, and of carefully testing the solution.—*London Journal of Medicine, August*, 1852, *p.* 750.

165.—ON THE THERAPEUTIC ACTION OF FURFURINE, NICKEL, &c.

By Prof. Simpson, Edinburgh.

[Furfurine is an alkaloid, that produces in poisonous doses upon the lower animals many of the symptoms produced by quinine. The following are the results of the experiments on the properties of the sulphate of nickel. The Professor says:]

Sulphate of nickel has appeared to me to act as a gentle metallic tonic. I have generally used it in doses of half a grain or a grain, repeated thrice daily, and have given it in the form either of simple solution or of pill. In large doses it is liable, like sulphate of zinc or copper, to produce sickness and nausea, particularly if taken upon an empty stomach. I have generally requested it to be taken half an hour or an hour after meals. It has appeared to me, as the result of pretty numerous experiments and observations, that the therapeutic actions of the salts of nickel and manganese correspond in a considerable degree with the therapeutic actions of the salts of iron upon the economy; and that these three metals might, under many conditions, be almost used as therapeutic substitutes for each other. But they also specifically differ from each other in some respects. For example, in one most interesting case the sulphate of nickel arrested a severe form of periodic headache, which had previously defied iron in many different forms, and all other kinds of treatment that had been em-

ployed. The patient came from Italy last autumn, in order to place herself under my professional care; and for some months I was as unsuccessful as my predecessors had been in affording her any relief. But let me give the history of the affection, and the ultimate result, in the lady's own words. She drew up the following note of her case several weeeks ago:—

"My headaches (she writes) came on soon after my second confinement in August 1847, and continued to return every tenth day without intermission, up to the first of February 1852. During the first four years I was in Italy, and was attended by medical men of all countries, English, French, German. and Italian. I also tried hydropathy and homœopathy, the latter for six months, but all without the slightest effect. The pain came on in a small spot on the right temple, and lasted from twenty-four to thirty-six hours. After the first eight hours severe sickness followed, which continued up to the sixteenth hour. During the attacks I had violent cold shivering fits, succeeded by a burning fever. At times I was quite delirious from the violence of the pain. I have taken large doses of steel, iron, and quinine, besides many other sorts of medicines. The quinine I took at first only two days before the attack was expected. I then took six grains every day for a year and a half, but it never put off the headache a moment beyond its day and hour, nor would anything that I could do bring it on before the time. When I first came to Scotland to be under the advice of Dr. Simpson in August, 1851, he gave me thirty grains of quinine a-day for three days before the headache was to come on; but it returned to its hour, and as severe as ever. This was tried also with the next fit, with no better success. Dr. Simpson then tried successively furfurine, bebeerine, and arsenic; but the headaches still continued up to the 1st of February, 1852, on which day I had a most severe attack. On the 4th of February, he gave me the solution of sulphate of nickel to take; since which time, to my astonishment, my usual headaches have altogether disappeared."

To the preceding account I have merely to add, that, if we may judge from the result up to the present time, the cure of this patient from the use of nickel appears entire and complete. And perhaps it is but proper to remark, that this result seems fairly attributable to the action of the nickel alone, inasmuch as there was no relief under the use of any of the means or medicines previously employed for years; while convalescence distinctly began from the date of the employment of the metal in question.

Further, it is perhaps not unimportant to observe, that while the disease had lasted four years without abatement, its subsidence in February could not be the result of change of climate, as the lady had already resided about five months in Edinburgh or its neighbourhood, without any noticeable amelioration in the recurrence and intensity of the headaches; and at last they disappeared under the nickel, at a period of the year—viz., the commencement of spring—at which, in our climate, headaches and other periodic diseases are known to be specially liable to become increased and aggravated.

In no kind of case is the beneficial action of iron more remarkable

than in the treatment of chlorosis and amenorrhœa. I have seen nickel in a similar way apparently serviceable under the same circumstances. In the latter end of last year, I gave it in a case of amenorrhœa of ten years' duration. The amenorrhœa supervened at the age of twenty-two. At the same time a galvanic intra-uterine bougie was introduced, and left for some time in the cavity of the uterus. In the course of three or four weeks menstruation took place, and has recurred regularly from that period. In such a case, however, it is difficult to say how far the result was attributable to the local means used, and what share the nickel had in the restoration of the patient's health.—*Monthly Journal of Med. Science, August,* 1852, *p.* 135.

166.—ON IODINE.

By Dr. Merei.

Iodine is a remedy which, I believe, we may justly call *anti-dyscrasic,* viz., which has the effect of promoting directly the depuration of the organic liquids from some dyscrasic elements. I am far from saying it is a general anti-dyscrasic, nor can I approve of the name of anti-scrofulous, as applied to it, scrofulous "being still a very vague," not to say superficial expression. But I can state the fact, that I have seen *improve,* under its use, *in a proportionally short time,* some hundreds of cases with different complaints, which we usually call scrofulous, and above all, those characterized by impetiginous or eczemato-impetiginous eruptions over the skin, the improvement or cure having been effected in the wards of the children's hospital, *without the influence of change of air or baths,* the usual assistants of antimonial and other remedies, regarded as anti-scrofulous, but which, in the hospital of Pesth, without those assistants, did clearly appear inefficacious. I beg to state, that if remedies would be subjected to similar trials in large hospitals, as we perform them in Pesth, with iodine and some other substances, by and by the number of pharmacological fallacies would become reduced. If any one should ask me, in what manner iodine acts as anti-dyscrasic, I am not perfectly sure how to answer. It acts, evidently, in a stimulant way upon the mucous membranes, the kidneys, and upon the liver. The latter action has not been *duly* noticed, though I can assure you that almost all bilious, or what they call hepatic constitutions, are most disagreeably affected even by small doses of iodine, so that these temperaments are seldom allowed to pass even through a mild course of iodide of potassium. Dyspepsy, for bilious vomiting, is a frequent effect, but I never observed bilious diarrhœa. The most obvious effect of it, however, is to produce irritation in the mucous membrane of the eyes and the nose connected; in higher degrees, with fever and headache, it acts decidedly upon the urinary apparatus, commonly increasing the secretion of urine, by which more or less of it is again carried out of the body. Its action upon the skin is the latest, and appears as consecutive to its stimulant action upon the mucous membranes. Iodine fever resembles catarrhal fever, and is frequently followed by perspiration. Salivation, and some

and is frequently followed by perspiration. Salivation, and some other effects of it, are less constant and important.

In some individuals, but very seldom in young children, we have observed a slight diminution of the testes; in some ladies the glandula mammaria has been diminished. These effects will sooner happen under long-continued small doses than under large ones, when they will excite febrile reaction.

I have observed that the more there was of iodine fever, with consequent crisis, the more evident was the anti-dyscrasic effect of this remedy.

In the clinical case-book of the Children's Hospital of Pesth there is a considerable number of different affections of bones, of one or more years' standing, in scrofulo-impetiginous children, which, under the phenomena of iodine-reaction, have been cured in the short time of one to three months.

After all that I have seen, it seems to me that *the anti-dyscrasic action of iodine is not a directly chemical one, like that of iron in chlorosis, but appears to depend upon producing a sort of disturbance, the reaction upon which is followed by the curative effect.* From this it seems to follow that whilst in chlorosis we must give iron in frequently-repeated small doses, iodine must be administered in the opposite way. Many cases, however, may be improved or cured without fever. Fever has also its minimum in the body, which is scarcely perceptible.

From the above statements it results that iodine, in order to become a strong curative power, requires a constitution fit for its reception and reaction upon it. Now, full, phlegmatic, or lymphatic constitutions bear it the best, the nervous less, the bilious the least of all. Atrophy and anæmia must be removed before we commence with iodine. And when we consider that atrophy is the most direct indication for cod-liver oil, and the most direct counter-indication for iodine, it becomes clear that these remedies act in an opposite way, and that cod-liver oil owes not its effects to its infinitessimal part of iodine.

Now, I should feel very glad were I able to point out to you and describe more exactly the cases in which you may expect advantages from iodine. But, without having before us the patients, it is scarcely possible to give you exact directions.

Comparatively full phlegmatic constitutions, affected with eczema-impetiginosum, or even with caries, supported, in general, the strongest iodine treatment, and had the best results of it. This is one of the best results we had in the Children's Hospital with that remedy. On the contrary, prurigo, impetigo, achor, lupus, scrofulous, or tuberculous infiltration of the glands, do not yield to the iodine treatment. Catarrho-scrofulous conjunctivitis also excludes the use of iodine, because under its action the inflammatory character of this affection almost constantly increases long before an anti-dyscrasic effect could be obtained. On the contrary, I frequently succeeded with it in torpid forms of swelling of the meibomian glands.

If a dyscrasic local affection, which we think proper to be successfully treated with iodine, does occur in an emaciated child, we must, before its use, improve the constitution with cod-liver oil; if the subject

is anæmic, a course of iron must precede. In children of a nervous temperament, or where we encounter a great disposition to catarrhal irritation of the intestines, we assist the iodine treatment with opium or Dover's powders.—*Provincial Med. and Surgical Journal, May* 26, 1852, *p.* 258.

167.—CHLOROFORM IN SCOTLAND.

[Prof. SIMPSON, of Edinburgh, in remarking upon this subject, observes:]

I am not aware of any death in Scotland or elsewhere from the use of chloroform in midwifery, out of the many thousand cases in which it has now been employed in the old and new world. Nor, indeed, does the obstetric patient run anything like the risk of the surgical patient; for, in midwifery, though the anæsthetic is required to be given for a far longer period, it does not require to be given so deeply as in surgery.

Since November, 1847, I have only attended twelve cases of labour in which chloroform was not used during delivery. In all my other cases I have employed it; and none of those patients, I venture to say, who have used it, would again choose to suffer the unnecessary pains attendant upon labour without it. Most of my obstetric brethren employ it as frequently as I do. After once beginning its use at an obstetric case, I generally leave its exhibition to be continued by the nurse, or by any intelligent friend of the patient who may be in the room. Some of our midwives use it in the cases which they themselves attend. Two weeks ago, one of them told me that she had now employed it herself in her own practice in above fifty cases, with nothing but the happiest results, and without meeting with any circumstances to give her the slightest feeling of uneasiness in its employment.

Chloroform is manufactured to a large extent by three or four chemical establishments in Edinburgh; and as its high price in England has been, I believe, one great cause of its slow introduction into general practice among you, let me state, that with us it is usually sold wholesale to apothecaries at six or seven shillings per pound weight; and it is retailed to medical men at eightpence, and to the general public at one shilling the ounce per weight. It ought to be as cheap in the South.

I am not aware that in Scotland, where chloroform is employed so very extensively and so very successfully by medical men and others, it is ever exhibited by any one except on a handkerchief, towel, or the like; no kind of formal apparatus is used. Doubtless, one principal point consists in diluting its vapour sufficiently freely with air, and this can always be readily accomplished when a handkerchief is employed. Some American and English practitioners have proposed to render the vapour of chloroform less strong by diluting it when used with the vapour of sulphuric ether, or of alcohol (as in the so-called chloric ether). But alcohol, &c., often leave headache and excitement, which chloroform does not. And it is surely a thousand-fold better to dilute it with the vapour of "common atmospheric air," than with any other diluting medium.—*Med. Times and Gazette, June* 19, 1852, *p.* 628.

168.—*On a New Kind of Alcohol.*—It is said that a new kind of alcohol has been discovered by M. Wurtz, a professor at the Ecole de Médécine, at Paris, by repeated distillations of the oil obtained from potatoes. Its composition is represented to be $C_8 H_{10} O_2$. He terms it *alcoöl entylique.—Provincial Med. and Surgical Journal, Sept.* 29, 1852, *p.* 518.

169.—ON PAGLIARI'S HÆMOSTATIC.

By M. Sedillot.

M. Pagliari, a pharmacien at Rome, professes to have discovered a styptic liquor of great power; and several of the officers of the French army have testified to its efficacy. M. Sedillot has also, on several occasions, brought forward cases in corroboration; and in the present paper he adduces additional ones, in some of which, considerable vessels, although not those of the first class, furnished the blood. He says that it has been objected, that compression is employed by means of bandages and charpie; but this is merely to prevent the coagula which form being removed from the mouths of the vessels; and it has only to be continued for twenty-four or forty-eight hours. So little plastic is human blood, that compression alone, unaided by styptics, would have to be so prolonged and forcible, that it would risk the formation of ulcers or gangrene in the parts to which it was applied.

M. Pagliari has now revealed the composition, which is as follows: Eight ounces of tincture of benzoin, one pound of alum, and ten pounds of water are boiled together for six hours in a glazed earthen vessel, the vaporized water being constantly replaced by hot water, so as not to interrupt the ebullition, and the resinous mass kept stirred round. The fluid is then filtered, and kept in stoppered bottles. It is limpid, slightly styptic in taste, aromatic in odour, and the colour of champagne. M. Hepp, of Strasburg, has substituted white resin for the benzoin. Every drop of this fluid poured into a glass containing human blood produces an instantaneous magma; and by increasing the proportion of the styptic to the quantity of the blood, a dense, homogenous, blackish mass results.

Many are the circumstances in which the surgeon may not be able to have recourse to the ligature, as in the case of friable arteries, secondary hemorrhage from deep-seated, painful, or inflamed wounds, the impossibility of seizing the artery, or where the hemorrhage results from numerous arterioles, which are too small or retracted, or from veins and capillary vessels. In all cases, in fact, where compression is now usually employed, without much benefit being expected to result from it, and often, indeed, proving useless or dangerous, this fluid seems indicated.—*Bull. de Thêr.*, tom. xlii. p. 491—502.—*Brit. and For. Med.-Chir. Review, Oct.* 1852, *p.* 558.

170.—ON THE SECONDARY DEGENERATION OF PARTICULAR FASCICULI OF THE SPINAL CORD, AND OF THEIR CONTINUATION TO THE BRAIN.

By Dr. Ludwig Turck.

The following is Dr. Turck's *resumé* of the deductions which he thinks himself entitled to draw from his observations:—

1st. When, owing to protracted disease in the brain or spinal column, the nervous currents, through certain fasciculi, remain for a length of time interrupted, these fasciculi, in consequence of the abrogation of their office, have produced within them numbers of granular cells; these represent the beginning of a more complete metamorphosis, to be perfected after a further lapse of time.

2nd. When, in such cases, transverse sections are made through the spinal marrow, medulla oblongata, pons Varolii, and the brain and its ganglia, and those points which are shown by the presence of abnormal cells upon these sections to be diseased are compared with reference to their position, we are enabled to pursue the anatomical track of these secondarily diseased fasciculi, and to arrive at conclusions with regard to the course of nervous currents. The results which follow agree in part with the previous views of the direction of nerve-fibres, and are partly such as could not be reached by anatomy and physiology alone.

3rd. A fasciculus of the spinal marrow descends from the crus cerebri, continuing through the longitudinal fibres of the pons Varolii and pyramid of the same side, until, reaching the decussation of the latter in the medulla oblongata (in one case in two fasciculi), it passes over to the opposite side, and descends almost to the extreme end of the spinal cord, constituting the posterior half of its lateral column. This we designate the "pyramidal track of the lateral column."

4th. The "pyramidal track of the lateral column" conveys a centrifugal current proceeding from the prominentæ lentiformes, corpora striata, optic thalamus, and medullary matter of the cerebrum (of which it cannot be said with certainty that it is a motor impulse), towards that side of the body opposite to the diseased half of the brain, but to the same side on which the fasciculus conducting this current is placed in the spinal column. This track is found to be diseased secondarily throughout, in cases of chronic apoplexy and other encephalic affections.

5th. A second fasciculus proceeds from the crus cerebri, and through the pons Varolii of the same side, as longitudinal fibres; but instead of crossing in the medulla oblongata, as was the case with the preceding pyramidal track, this second fasciculus descends on the same side of the spinal cord, as an internal division of the anterior column, where, however, its secondary affections terminate rather higher than those of

the posterior section of the opposite lateral column. This we call the "enveloping track of the anterior column."

6th. The "enveloping track of the anterior column" conveys an impulse in a centrifugal direction to that side of the body opposite to the disease of the brain, and likewise opposite to the conducting track of the spinal marrow; and brought from the prominentiæ lentiformes, and corpora striata. This track probably conveys a motor impulse, and it is found secondarily affected when disease exists in one or both of the last-mentioned ganglia of the brain.

7th. With the exception of the above-mentioned tracks, neither the grey matter nor any other of the fasciculi was found diseased secondarily to affection of the brain.

8th. It is not decided whether the motor impulses, proceeding from the cerebrum, are conducted downwards through these two above-mentioned tracks alone, or seek some other way.

9th. The internal section of the posterior column continues through the soft fasciculi of the crura, and appears to reach its final termination on the floor of the fourth ventricle. By this track a centripetal nervous current is conducted, and it is found secondarily diseased above that point in the spinal cord at which effusion has destroyed the conducting power and arrested the centripetal stream.

10th. A second track, likewise centripetal, is found in the posterior half of the lateral column, and consequently a deposition of granular cells within this track above a point at which an affection of the spinal cord may have occurred. In this posterior half there is both a centripetal and centrifugal conduction. The fasciculi united in the posterior half of the lateral column separate in the medulla oblongata, the centrifugal coming from the pyramids, whilst the centripetal in the medulla, directing itself always more backwards, mounts to the corpora restiformia.

11th. With the exception of the centripetal tracks mentioned in Nos. 9 and 10, neither the grey matter nor any other fasciculi of the spinal cord were found secondarily diseased.

12th. Whether through these two tracks the sense of muscular tonicity or ordinary sensation is manifested, remains at the present unascertained.

13th. The remaining fasciculi of the spinal cord are to be considered as separated in their anatomical and physiological character from those that have been treated of above. In the first place, the separation in the cervical portion of the spinal marrow exhibited between the external and internal sections of the anterior column by the sulcus intermedius anterior, is established as a complete division of those parts extending to the lowest extremity of the spinal cord. The same is probable with regard to the separation of the posterior column into two lateral sections by the sulcus intermedius posterior, although this is only demonstrated so far as the fourth thoracic pair of nerves. A similar

division is found between the anterior and posterior sections of the lateral column, not exhibited, however, by any external mark of separation. Each half, therefore, of the spinal cord includes six fasciculi. Secondly, it is evident that these fasciculi do not conduct a centripetal current originating in either the lower extremities or the lower section of the trunk; perhaps they may serve for such currents from the upper extremities, or the superior portions of the trunk, but this is not probable. And it is yet undecided whether these tracks are used by centrifugal stimulation having its origin in special portions of the cerebrum or cerebellum.

14th. The grey matter is not subject to the formation within it of these abnormal cells; from which, however, no conclusion can be absolutely drawn with regard to its powers of conduction.—*Transactions of the Imperial Academy of Science, Vienna*, 1851.

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